

付録1. 火山ガラスの主成分元素データ

Sample	Pumice	Analysis	SiO ₂	Al ₂ O ₃	FeO	MgO	MnO	Na ₂ O	K ₂ O	TiO ₂	CaO
BIEL-3-	101	102	77.61	12.60	0.46	0.07	0.05	2.72	5.63	0.06	0.80
BIEL-3-	101	25	77.46	12.69	0.35	0.05	0.09	2.64	5.73	0.19	0.80
BIEL-3-	101	59	77.45	12.57	0.40	0.04	0.15	3.31	5.14	0.15	0.79
BIEL-3-	101	64	77.45	12.59	0.49	0.05	0.15	2.70	5.70	0.15	0.72
BIEL-3-	101	52	77.59	12.53	0.49	0.04	0.12	3.14	5.33	0.04	0.72
BIEL-3-	101	60	77.50	12.50	0.46	0.01	0.12	3.22	5.22	0.19	0.78
BIEL-3-	101	103	77.53	12.59	0.51	0.05	0.07	2.61	5.81	0.02	0.81
BIEL-3-	101	69	77.54	12.51	0.50	0.00	0.09	2.75	5.75	0.08	0.78
BIEL-3-	101	12	77.57	12.58	0.36	0.04	0.11	2.97	5.47	0.11	0.79
BIEL-3-	101	68	77.66	12.53	0.50	0.02	0.00	3.02	5.51	0.04	0.72
BIEL-3-	101	22	77.69	12.60	0.31	0.07	0.06	2.72	5.62	0.19	0.74
BIEL-3-	101	24	77.59	12.57	0.41	0.05	0.12	2.73	5.83	0.06	0.64
BIEL-3-	101	66	77.59	12.44	0.43	0.07	0.15	3.01	5.49	0.00	0.82
BIEL-3-	101	11	77.76	12.53	0.42	0.00	0.07	3.03	5.50	0.01	0.68
BIEL-3-	101	54	77.60	12.51	0.39	0.04	0.15	3.22	5.20	0.12	0.77
BIEL-3-	101	55	77.69	12.63	0.37	0.02	0.04	3.03	5.46	0.00	0.75
BIEL-3-	101	65	77.64	12.63	0.52	0.01	0.10	3.07	5.26	0.07	0.70
BIEL-3-	101	10	77.69	12.52	0.47	0.06	0.12	3.09	5.28	0.01	0.76
BIEL-3-	101	56	77.67	12.65	0.48	0.00	0.03	3.09	5.26	0.11	0.71
BIEL-3-	101	105	77.68	12.58	0.44	0.03	0.08	2.96	5.42	0.07	0.74
BIEL-3-	101	58	77.70	12.64	0.47	0.04	0.12	2.83	5.53	0.00	0.67
BIEL-3-	101	57	77.72	12.54	0.50	0.02	0.00	3.22	5.14	0.21	0.65
BIEL-3-	101	13	77.74	12.47	0.49	0.06	0.05	3.01	5.36	0.14	0.68
BIEL-3-	101	8	77.75	12.47	0.44	0.03	0.14	3.20	5.12	0.10	0.75
BIEL-3-	101	63	77.80	12.61	0.41	0.00	0.00	2.83	5.59	0.08	0.68
BIEL-3-	102	13	77.80	12.45	0.50	0.06	0.01	3.16	5.17	0.07	0.77
BIEL-3-	102	15	77.84	12.49	0.34	0.06	0.20	3.04	5.19	0.09	0.76
BIEL-3-	102	18	77.60	12.54	0.39	0.07	0.20	3.13	5.21	0.05	0.80
BIEL-3-	102	21	77.63	12.45	0.45	0.03	0.12	3.23	5.17	0.13	0.79
BIEL-3-	102	24	77.76	12.57	0.44	0.04	0.19	2.96	5.25	0.01	0.77
BIEL-3-	103	32	77.67	12.48	0.35	0.10	0.22	3.26	5.06	0.13	0.72
BIEL-3-	103	33	77.50	12.69	0.47	0.09	0.05	2.99	5.42	0.01	0.79
BIEL-3-	103	35	77.76	12.46	0.34	0.11	0.10	3.18	5.32	0.05	0.70
BIEL-3-	103	37	77.70	12.68	0.57	0.04	0.15	2.94	5.16	0.07	0.69
BIEL-3-	103	38	77.61	12.63	0.41	0.10	0.16	3.21	5.10	0.00	0.77
BIEL-3-	103	39	77.53	12.75	0.47	0.00	0.03	3.02	5.31	0.13	0.75
BIEL-3-	103	40	77.37	12.64	0.52	0.13	0.12	3.20	5.24	0.00	0.79
BIEL-3-	104	41	77.62	12.54	0.37	0.04	0.06	3.22	5.24	0.08	0.84
BIEL-3-	104	42	77.45	12.68	0.58	0.00	0.16	2.97	5.36	0.07	0.73
BIEL-3-	104	43	77.58	12.46	0.55	0.08	0.09	3.09	5.27	0.04	0.84
BIEL-3-	104	44	77.67	12.56	0.38	0.07	0.17	3.10	5.13	0.07	0.84
BIEL-3-	104	47	77.81	12.58	0.47	0.02	0.07	3.09	5.19	0.02	0.75
BIEL-3-	106	52	77.70	12.55	0.34	0.06	0.08	3.24	5.16	0.11	0.77
BIEL-3-	106	54	77.61	12.69	0.42	0.04	0.17	3.04	5.23	0.04	0.76
BIEL-3-	106	56	77.57	12.64	0.41	0.03	0.06	3.05	5.36	0.09	0.80
BIEL-3-	106	58	77.61	12.79	0.35	0.04	0.05	3.09	5.23	0.03	0.79
BIEL-3-	106	60	77.53	12.71	0.53	0.05	0.07	2.96	5.32	0.05	0.76
BIEL-3-	107	61	77.66	12.62	0.38	0.10	0.14	2.96	5.38	0.00	0.77
BIEL-3-	107	64	77.48	12.70	0.45	0.03	0.06	3.01	5.40	0.13	0.74
BIEL-3-	107	65	77.53	12.69	0.50	0.06	0.19	3.09	5.22	0.02	0.70
BIEL-3-	107	68	77.56	12.57	0.53	0.05	0.16	3.14	5.13	0.10	0.75
BIEL-3-	108	78	77.69	12.61	0.41	0.06	0.04	3.24	5.09	0.06	0.81
BIEL-3-	108	80	77.57	12.55	0.48	0.07	0.13	3.22	5.23	0.00	0.75
BIEL-3-	109	83	77.35	12.62	0.63	0.00	0.05	3.25	5.17	0.15	0.78
BIEL-3-	109	84	77.53	12.68	0.53	0.05	0.06	2.94	5.31	0.11	0.80
BIEL-3-	109	87	77.37	12.82	0.54	0.00	0.12	3.22	5.11	0.00	0.83
BIEL-3-	109	88	77.71	12.66	0.45	0.05	0.00	3.11	5.24	0.01	0.78
BIEL-3-	109	90	77.40	12.76	0.43	0.02	0.10	3.19	5.13	0.15	0.83
BIEL-3-	109	92	77.45	12.73	0.54	0.05	0.00	3.17	5.27	0.03	0.76
BIEL-3-	110	94	77.52	12.57	0.48	0.03	0.11	3.23	5.23	0.12	0.72
BIEL-3-	110	95	77.62	12.68	0.53	0.07	0.02	3.26	5.04	0.05	0.75
BIEL-3-	110	97	77.78	12.57	0.59	0.00	0.06	3.03	5.27	0.01	0.70
BIEL-3-	110	98	77.77	12.56	0.48	0.09	0.14	3.10	5.09	0.02	0.74
BIEL-3-	110	99	77.68	12.62	0.39	0.00	0.15	3.13	5.24	0.06	0.74
BIEL-3-	111	103	77.59	12.62	0.45	0.02	0.11	3.24	5.09	0.10	0.79
BIEL-3-	111	106	77.60	12.52	0.53	0.06	0.10	3.19	5.12	0.13	0.75
BIEL-3-	111	110	77.52	12.57	0.63	0.04	0.00	3.22	5.09	0.13	0.79
BIEL-3-	111	111	77.59	12.70	0.47	0.03	0.00	3.23	5.10	0.13	0.74
BIEL-3-	111	112	77.49	12.55	0.59	0.06	0.08	3.17	5.20	0.08	0.77
BIEL-3-	112	113	77.67	12.64	0.38	0.07	0.10	3.26	5.04	0.13	0.72
BIEL-3-	112	120	77.57	12.62	0.43	0.00	0.12	3.01	5.42	0.06	0.77
BIEL-3-	112	121	77.85	12.60	0.41	0.00	0.10	3.11	5.21	0.02	0.70
BIEL-3-	112	122	77.46	12.68	0.39	0.05	0.13	3.17	5.28	0.08	0.76
BIEL-3-	113	125	77.77	12.58	0.36	0.09	0.15	2.78	5.43	0.11	0.73
BIEL-3-	113	126	77.75	12.54	0.47	0.03	0.07	2.80	5.47	0.12	0.75
BIEL-3-	113	129	77.75	12.45	0.41	0.03	0.04	3.13	5.40	0.10	0.70
BIEL-3-	114	133	77.71	12.66	0.37	0.02	0.10	2.95	5.33	0.16	0.69
BIEL-3-	114	138	77.74	12.55	0.41	0.00	0.08	3.15	5.20	0.04	0.82
BIEL-3-	114	139	77.73	12.47	0.39	0.10	0.09	3.16	5.16	0.09	0.81
BIEL-3-	115	144	77.80	12.70	0.38	0.00	0.00	3.21	5.15	0.01	0.74
BIEL-3-	115	145	77.57	12.60	0.55	0.02	0.09	3.28	5.01	0.07	0.80
BIEL-3-	115	146	77.64	12.58	0.44	0.06	0.10	3.34	5.01	0.00	0.82
BIEL-3-	115	147	77.46	12.66	0.46	0.00	0.15	3.19	5.19	0.07	0.81
BIEL-3-	115	148	77.82	12.48	0.49	0.02	0.02	3.21	5.11	0.12	0.74
BIEL-3-	115	152	77.69	12.54	0.53	0.08	0.00	3.31	5.06	0.00	0.78

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Sample	Pumice	Analysis	SiO2	Al2O3	FeO	MgO	MnO	Na2O	K2O	TiO2	CaO
TOKM-1-	201	147	77.65	12.76	0.57	0.11	0.10	3.37	4.88	0.00	0.56
TOKM-1-	201	130	77.67	12.66	0.55	0.10	0.04	2.88	5.37	0.11	0.62
TOKM-1-	201	148	78.90	11.87	0.65	0.06	0.17	2.56	5.13	0.06	0.60
TOKM-1-	202	153	77.93	12.58	0.79	0.15	0.04	3.71	3.67	0.21	0.92
TOKM-1-	202	156	77.61	12.68	0.91	0.20	0.09	3.73	3.60	0.22	0.96
TOKM-1-	202	158	77.78	12.65	0.70	0.22	0.13	3.74	3.63	0.17	0.98
TOKM-1-	202	160	77.52	12.56	0.99	0.18	0.00	3.79	3.65	0.26	1.05
TOKM-1-	203	163	78.04	12.51	0.88	0.22	0.00	3.73	3.49	0.16	0.98
TOKM-1-	203	164	77.63	12.75	0.82	0.16	0.11	3.78	3.53	0.20	1.04
TOKM-1-	203	166	77.79	12.63	0.99	0.15	0.00	3.82	3.53	0.16	0.94
TOKM-1-	203	169	77.82	12.65	0.91	0.17	0.11	3.75	3.44	0.21	0.95
TOKM-1-	203	172	77.99	12.51	0.84	0.23	0.00	3.74	3.50	0.14	1.05
TOKM-1-	203	173	77.88	12.69	0.69	0.20	0.01	3.78	3.60	0.20	0.95
TOKM-1-	204	174	77.51	12.80	0.56	0.06	0.17	3.54	4.62	0.08	0.66
TOKM-1-	204	176	77.52	12.69	0.67	0.04	0.13	3.44	4.77	0.14	0.59
TOKM-1-	204	178	77.61	12.58	0.65	0.04	0.20	3.49	4.69	0.10	0.63
TOKM-1-	204	179	77.70	12.58	0.63	0.05	0.04	3.61	4.73	0.08	0.57
TOKM-1-	204	180	77.65	12.48	0.63	0.08	0.11	3.61	4.67	0.16	0.60
TOKM-1-	205	184	77.60	12.53	0.72	0.05	0.14	3.56	4.63	0.18	0.59
TOKM-1-	205	185	77.52	12.56	0.72	0.04	0.20	3.62	4.66	0.10	0.59
TOKM-1-	205	186	77.31	12.69	0.73	0.05	0.06	3.70	4.65	0.15	0.66
TOKM-1-	205	189	77.39	12.79	0.60	0.03	0.16	3.66	4.68	0.11	0.58
TOKM-1-	205	190	77.60	12.61	0.66	0.06	0.06	3.54	4.67	0.15	0.67
TOKM-1-	205	192	77.57	12.73	0.68	0.05	0.03	3.56	4.61	0.10	0.67
TOKM-1-	206	195	77.67	12.72	0.58	0.09	0.09	3.45	4.75	0.09	0.57
TOKM-1-	206	197	77.55	12.65	0.65	0.11	0.09	3.58	4.61	0.14	0.61
TOKM-1-	206	198	77.56	12.71	0.59	0.03	0.04	3.57	4.68	0.22	0.61
TOKM-1-	209	205	77.26	12.94	0.73	0.11	0.00	3.40	4.79	0.14	0.63
TOKM-1-	209	206	77.39	13.00	0.63	0.07	0.11	3.10	5.13	0.07	0.48
TOKM-1-	209	207	77.88	12.56	0.48	0.00	0.00	3.00	5.54	0.06	0.48
TOKM-1-	209	209	77.79	12.53	0.73	0.00	0.00	3.14	5.17	0.06	0.57
TOKM-1-	209	212	77.79	12.69	0.68	0.01	0.00	2.58	5.64	0.06	0.56
TOKM-1-	209	214	78.01	12.46	0.49	0.05	0.08	2.69	5.62	0.07	0.53
TOKM-1-	209	215	77.87	12.64	0.68	0.04	0.00	2.82	5.29	0.12	0.52
TOKM-1-	209	216	77.18	13.23	0.45	0.08	0.11	2.32	5.97	0.06	0.59
TOKM-1-	210	217	77.33	12.88	0.71	0.08	0.09	3.17	4.92	0.20	0.61
TOKM-1-	210	220	77.60	12.72	0.56	0.04	0.05	3.37	4.99	0.03	0.65
TOKM-1-	210	221	77.68	12.68	0.60	0.07	0.08	3.28	4.94	0.00	0.68
TOKM-1-	210	227	77.70	12.64	0.48	0.07	0.09	3.17	5.13	0.12	0.61
TOKM-1-	210	229	77.56	12.66	0.63	0.05	0.00	3.28	5.13	0.10	0.60
TOKM-1-	211	233	77.75	12.62	0.76	0.11	0.04	3.49	4.51	0.05	0.67
TOKM-1-	211	235	77.72	12.57	0.53	0.06	0.11	3.51	4.70	0.14	0.66
TOKM-1-	211	237	77.64	12.73	0.62	0.03	0.00	3.49	4.75	0.08	0.67
TOKM-1-	211	238	77.14	12.95	0.67	0.00	0.14	3.50	4.71	0.20	0.69
TOKM-1-	211	240	77.53	12.74	0.67	0.10	0.09	3.43	4.70	0.12	0.61
TOKM-1-	211	241	77.67	12.56	0.58	0.01	0.17	3.40	4.86	0.12	0.63
TOKM-1-	211	242	77.43	12.89	0.56	0.02	0.10	3.40	4.85	0.11	0.64
TOKM-1-	212	243	77.79	12.73	0.83	0.14	0.02	3.80	3.55	0.17	0.97
TOKM-1-	212	246	77.86	12.42	1.00	0.16	0.00	3.79	3.61	0.23	0.94
TOKM-1-	212	249	77.64	12.69	0.87	0.13	0.12	3.73	3.72	0.17	0.92
TOKM-1-	212	250	77.63	12.86	0.97	0.17	0.00	3.72	3.61	0.18	0.86
TOKM-1-	212	251	77.69	12.63	1.04	0.15	0.01	3.78	3.61	0.26	0.84
TOKM-1-	212	252	77.62	12.81	0.87	0.12	0.05	3.89	3.57	0.14	0.93
TOKM-1-	212	253	77.97	12.48	0.85	0.15	0.03	3.73	3.63	0.26	0.89
TOKM-1-	213	256	78.03	12.64	0.63	0.23	0.08	3.65	3.66	0.12	0.96
TOKM-1-	213	258	77.82	12.82	0.70	0.19	0.06	3.62	3.69	0.20	0.89
TOKM-1-	213	261	77.60	12.76	0.94	0.15	0.13	3.65	3.66	0.06	1.04
TOKM-1-	213	263	77.47	12.77	0.87	0.11	0.08	3.75	3.68	0.28	1.00
TOKM-1-	214	265	77.23	12.93	0.66	0.03	0.00	3.27	5.12	0.20	0.55
TOKM-1-	214	266	77.31	12.87	0.47	0.09	0.06	3.06	5.33	0.22	0.60
TOKM-1-	214	267	77.57	12.71	0.54	0.03	0.07	3.12	5.25	0.08	0.62
TOKM-1-	214	268	77.10	12.90	0.66	0.09	0.17	3.22	5.07	0.20	0.58
TOKM-1-	214	272	77.23	12.80	0.63	0.07	0.22	3.50	4.84	0.08	0.63
TOKM-1-	214	273	77.52	12.76	0.62	0.06	0.01	3.05	5.20	0.09	0.69
TOKM-1-	214	274	77.24	12.84	0.65	0.04	0.12	2.93	5.40	0.16	0.61
TOKM-1-	215	277	77.31	12.69	0.65	0.06	0.13	3.70	4.64	0.17	0.65
TOKM-1-	215	279	77.72	12.63	0.67	0.05	0.00	3.56	4.68	0.10	0.60
TOKM-1-	215	283	77.47	12.68	0.58	0.10	0.14	3.62	4.58	0.21	0.62
TOKM-1-	215	286	77.56	12.66	0.59	0.06	0.00	3.69	4.68	0.13	0.62
TOKM-1-	215	287	77.58	12.67	0.58	0.10	0.10	3.53	4.66	0.16	0.62
TOKA-3-	301	77	77.37	12.64	0.81	0.13	0.15	3.65	4.10	0.21	0.93
TOKA-3-	301	71	77.38	12.62	0.88	0.18	0.16	3.63	3.92	0.26	0.96
TOKA-3-	301	76	77.56	12.49	0.92	0.18	0.03	3.60	4.12	0.11	0.99
TOKA-3-	301	88	77.53	12.60	0.91	0.15	0.16	3.60	3.87	0.26	0.92
TOKA-3-	301	93	77.58	12.60	0.96	0.19	0.00	3.53	4.12	0.14	0.88
TOKA-3-	301	84	77.61	12.73	0.74	0.17	0.08	3.62	4.06	0.06	0.93
TOKA-3-	301	81	77.68	12.58	0.75	0.19	0.05	3.41	4.19	0.16	0.98
TOKA-3-	301	74	77.65	12.56	0.81	0.20	0.11	3.40	4.16	0.17	0.94
TOKA-3-	301	92	77.86	12.60	0.89	0.13	0.01	3.53	3.99	0.04	0.94
TOKA-3-	301	95	77.94	12.52	0.72	0.14	0.00	3.75	3.95	0.02	0.94
TOKA-3-	301	97	77.71	12.59	0.84	0.18	0.06	3.69	3.81	0.17	0.95
TOKA-3-	301	94	77.89	12.74	0.85	0.18	0.00	3.53	3.82	0.03	0.96
TOKA-3-	302	297	77.50	12.79	0.62	0.02	0.06	3.49	4.84	0.09	0.59
TOKA-3-	302	298	77.16	12.75	0.70	0.08	0.15	3.44	5.03	0.09	0.60

付録1. 火山ガラスの主成分元素データ

Sample	Pumice	Analysis	SiO2	Al2O3	FeO	MgO	MnO	Na2O	K2O	TiO2	CaO
KMB-6	402	466	77.66	12.20	1.40	0.13	0.02	3.63	3.37	0.29	1.28
KMB-6	402	467	77.95	12.21	1.54	0.13	0.00	3.62	3.25	0.20	1.11
KMB-6	403	468	66.40	20.34	1.38	0.07	0.08	5.29	1.64	0.23	4.58
KMB-6	403	471	77.52	12.28	1.55	0.26	0.09	3.39	3.43	0.17	1.31
KMB-6	403	476	74.82	14.40	1.26	0.16	0.07	4.35	2.69	0.08	2.18
KMB-6	403	477	77.00	12.60	1.52	0.23	0.07	3.77	3.02	0.26	1.53
KMB-6	404	478	77.56	12.43	1.30	0.13	0.14	3.72	3.12	0.25	1.36
KMB-6	404	479	77.69	12.36	1.41	0.15	0.13	3.58	3.18	0.21	1.29
KMB-6	404	480	77.70	12.48	1.22	0.22	0.05	3.52	3.23	0.24	1.34
KMB-6	404	481	76.18	13.45	1.40	0.12	0.00	4.06	2.92	0.14	1.73
KMB-6	404	482	76.07	13.25	1.59	0.22	0.12	4.13	2.72	0.21	1.69
KMB-6	404	483	77.61	12.41	1.46	0.25	0.00	3.45	3.48	0.16	1.19
KMB-6	404	485	77.15	12.64	1.40	0.13	0.08	3.57	3.38	0.27	1.38
KMB-6	404	486	77.16	12.77	1.80	0.17	0.00	3.07	3.66	0.08	1.28
KMB-6	404	488	77.22	12.26	1.76	0.24	0.17	3.67	3.21	0.17	1.30
KMB-6	405	489	77.50	12.45	1.34	0.25	0.02	3.56	3.07	0.34	1.46
KMB-6	405	490	77.44	12.38	1.58	0.15	0.07	3.45	3.36	0.20	1.37
KMB-6	405	491	77.69	12.22	1.49	0.22	0.07	3.78	3.10	0.10	1.34
KMB-6	405	492	77.01	12.44	1.50	0.24	0.04	3.58	3.36	0.28	1.55
KMB-6	405	493	77.78	12.24	1.51	0.16	0.00	3.51	3.28	0.21	1.30
KMB-6	405	495	77.57	12.34	1.61	0.20	0.07	3.32	3.36	0.19	1.35
KMB-6	405	496	77.17	12.43	1.54	0.15	0.09	3.76	3.16	0.19	1.52
KMB-6	405	497	77.54	12.45	1.41	0.17	0.01	3.59	3.34	0.08	1.41
KMB-6	405	498	77.37	12.59	1.51	0.16	0.10	3.84	2.97	0.06	1.41
KMB-6	406	505	77.16	12.76	1.35	0.11	0.00	3.78	2.98	0.27	1.60
KMB-6	406	507	77.25	12.60	1.57	0.16	0.09	3.74	3.09	0.16	1.33
KMB-6	406	508	77.71	12.42	1.37	0.13	0.00	3.89	3.04	0.20	1.23
KMB-6	406	511	77.94	12.25	1.42	0.13	0.00	3.53	3.31	0.16	1.25
KMB-6	407	512	77.50	12.59	1.48	0.11	0.00	3.75	2.95	0.20	1.41
KMB-6	407	514	77.50	12.57	1.44	0.17	0.00	3.62	3.16	0.17	1.37
KMB-6	407	516	77.12	12.58	1.47	0.09	0.08	3.96	3.05	0.19	1.45
KMB-6	407	520	77.34	12.60	1.44	0.13	0.00	3.85	3.02	0.14	1.48
KMB-6	408	522	77.22	12.45	1.49	0.15	0.18	3.79	3.13	0.29	1.29
KMB-6	408	524	77.03	12.73	1.53	0.10	0.09	3.84	3.09	0.19	1.40
KMB-6	408	526	77.75	12.18	1.58	0.12	0.00	3.50	3.31	0.26	1.30
KMB-6	408	529	77.32	12.59	1.45	0.18	0.07	4.01	2.86	0.11	1.41
KMB-6	408	530	77.73	12.33	1.41	0.15	0.01	3.71	3.07	0.22	1.36
KMB-6	408	532	77.72	11.97	1.47	0.15	0.13	3.52	3.34	0.27	1.44
KMB-6	409	533	73.24	15.61	1.21	0.14	0.20	4.41	2.49	0.05	2.65
KMB-6	409	534	77.35	12.50	1.49	0.21	0.21	2.91	3.65	0.18	1.50
KMB-6	409	535	77.38	12.40	1.37	0.21	0.09	3.41	3.38	0.17	1.58
KMB-6	409	537	77.55	12.66	1.42	0.18	0.03	3.23	3.25	0.25	1.43
KMB-6	409	538	77.70	12.40	1.31	0.14	0.25	3.14	3.41	0.11	1.53
KMB-6	409	540	78.17	12.05	1.56	0.14	0.00	3.70	2.79	0.31	1.27
KMB-6	409	544	75.20	13.98	1.28	0.20	0.09	3.81	2.91	0.33	2.21
KMB-6	409	546	76.23	13.29	1.39	0.09	0.00	3.26	3.73	0.27	1.74
KMB-6	409	547	73.54	15.05	1.26	0.18	0.17	4.12	2.87	0.21	2.59
KMB-6	409	548	77.77	12.42	1.39	0.21	0.00	2.80	3.92	0.19	1.29
KMB-6	409	549	77.14	12.68	1.30	0.10	0.19	2.94	3.88	0.33	1.44
KMB-6	409	550	74.14	14.59	1.22	0.13	0.00	3.64	3.28	0.33	2.67
KMB-6	409	552	77.20	12.55	1.56	0.22	0.00	3.38	3.45	0.26	1.38
KMB-6	409	553	77.67	12.55	1.34	0.21	0.00	3.47	3.24	0.21	1.32
KMB-6	409	554	77.92	12.60	1.35	0.21	0.03	3.00	3.61	0.03	1.25
KMB-6	409	556	77.27	12.51	1.48	0.18	0.05	3.16	3.74	0.15	1.46
KMB-6	409	557	73.45	15.20	1.28	0.17	0.26	4.15	2.74	0.16	2.59
KMB-6	409	558	76.07	13.34	1.60	0.23	0.08	3.23	3.46	0.29	1.70
KMB-6	410	559	77.30	12.56	1.36	0.17	0.13	3.72	3.05	0.30	1.41
KMB-6	410	563	77.15	12.69	1.48	0.10	0.02	4.02	2.85	0.24	1.46
KMB-6	410	564	76.61	12.66	1.55	0.15	0.16	4.02	2.97	0.33	1.54
KMB-6	410	565	77.08	12.76	1.68	0.16	0.00	3.74	3.08	0.06	1.44
KMB-6	410	566	77.29	12.17	1.70	0.20	0.04	4.07	2.81	0.15	1.56
KMB-6	410	567	76.29	13.12	1.51	0.16	0.01	3.94	2.97	0.24	1.75
KMB-6	410	568	75.07	13.99	1.39	0.12	0.13	4.17	2.86	0.15	2.13
KMB-6	411	569	77.78	12.29	1.55	0.17	0.06	3.27	3.37	0.20	1.31
KMB-6	411	570	77.00	12.69	1.43	0.20	0.14	3.61	3.15	0.29	1.48
KMB-6	411	571	73.83	14.97	1.28	0.09	0.11	4.53	2.57	0.06	2.57
KMB-6	411	573	75.51	13.68	1.50	0.15	0.04	4.05	2.83	0.23	2.02
KMB-6	411	574	77.66	12.20	1.52	0.11	0.08	3.81	3.03	0.24	1.35
KMB-6	411	576	76.66	13.39	1.16	0.16	0.00	3.86	3.16	0.08	1.52
KMB-6	411	577	74.89	14.43	1.05	0.09	0.09	4.36	2.67	0.18	2.23
KMB-6	411	578	75.70	13.66	1.35	0.19	0.14	3.79	3.12	0.33	1.73
KMB-6	412	579	77.88	12.29	1.47	0.21	0.00	3.60	3.06	0.13	1.36
KMB-6	412	582	77.90	12.29	1.49	0.05	0.16	3.59	3.14	0.15	1.23
KMB-6	412	583	75.83	13.55	1.42	0.10	0.07	4.03	2.95	0.20	1.85
KMB-6	412	586	76.95	12.80	1.38	0.18	0.00	3.77	3.13	0.22	1.56
KMB-6	412	587	75.61	13.72	1.21	0.18	0.00	4.14	2.86	0.23	2.04
KMB-6	413	589	77.45	12.41	1.51	0.19	0.00	3.35	3.46	0.13	1.51
KMB-6	413	591	76.60	13.25	1.29	0.13	0.11	3.85	2.92	0.13	1.70
KMB-6	413	592	77.59	12.70	1.21	0.17	0.03	3.74	3.11	0.15	1.29
KMB-6	413	594	76.99	12.70	1.52	0.15	0.04	3.77	3.18	0.23	1.42
KMB-6	414	596	78.04	12.18	1.30	0.20	0.05	3.79	3.06	0.15	1.24
KMB-6	414	598	76.02	13.77	1.37	0.12	0.00	3.96	2.86	0.12	1.78
KMB-6	414	599	76.98	12.74	1.37	0.18	0.04	4.03	2.92	0.23	1.50
KMB-6	414	600	77.07	12.95	1.29	0.20	0.03	3.70	3.08	0.18	1.50
KMB-6	414	601	77.33	12.56	1.36	0.19	0.06	3.71	3.18	0.24	1.37

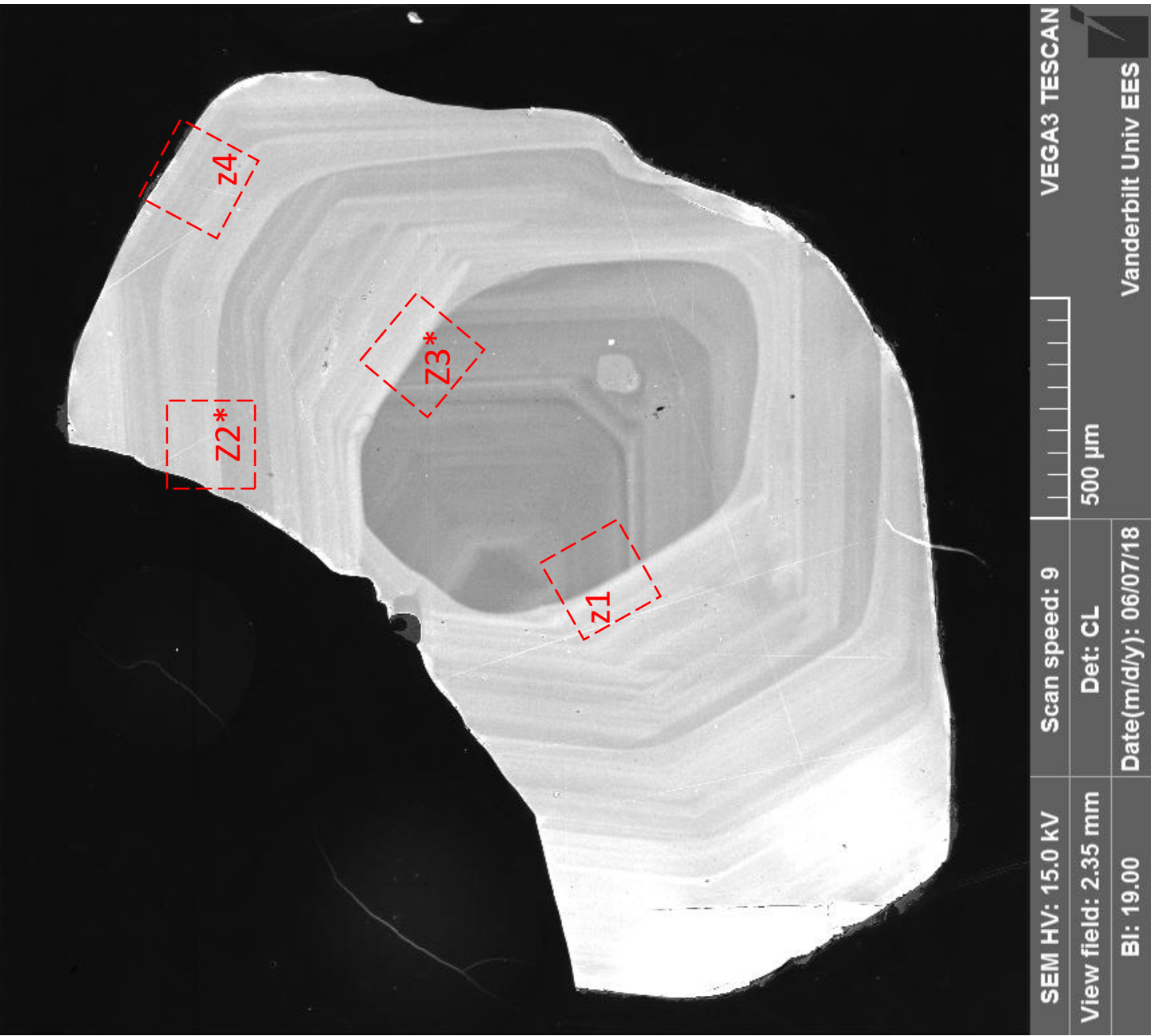
付録1. 火山ガラスの主成分元素データ

Sample	Pumice	Analysis	SiO2	Al2O3	FeO	MgO	MnO	Na2O	K2O	TiO2	CaO
KMB-6-	415	603	77.16	12.77	1.30	0.17	0.08	3.87	2.96	0.26	1.44
KMB-6-	415	604	77.39	12.48	1.54	0.17	0.07	3.89	3.02	0.14	1.30
KMB-6-	415	607	77.39	12.46	1.57	0.18	0.04	3.80	3.01	0.11	1.44
KMB-2-	420	7	76.61	12.99	1.22	0.32	0.17	3.83	2.89	0.26	1.44
KMB-2-	420	8	75.74	13.38	1.79	0.09	0.00	4.07	3.11	0.00	1.83
KMB-2-	420	9	76.80	13.08	1.57	0.13	0.00	3.89	2.78	0.32	1.45
KMB-2-	420	10	76.53	13.01	1.76	0.15	0.00	4.31	2.73	0.16	1.36
KMB-2-	420	11	76.44	13.28	1.22	0.14	0.00	4.14	3.10	0.16	1.52
KMB-2-	420	12	76.16	12.96	1.68	0.22	0.15	4.21	3.07	0.13	1.42
KMB-2-	420	13	75.47	13.29	2.05	0.22	0.05	4.02	3.07	0.46	1.37
KMB-2-	420	14	76.29	13.12	1.85	0.22	0.00	4.24	2.58	0.19	1.51
KMB-2-	420	15	75.97	13.07	1.89	0.31	0.00	4.04	2.90	0.13	1.40
KMB-2-	420	16	76.21	13.41	1.73	0.07	0.00	4.03	2.82	0.09	1.63
KMB-2-	420	17	76.80	12.69	1.41	0.14	0.00	3.92	2.90	0.31	1.54
KMB-2-	420	18	76.99	12.53	1.61	0.20	0.00	3.90	2.86	0.09	1.55
KMB-2-	420	19	76.60	12.92	1.49	0.22	0.10	4.13	3.13	0.00	1.41
KMB-2-	420	20	76.22	13.02	1.60	0.12	0.00	4.36	2.85	0.30	1.53
KMB-2-	420	21	75.85	12.89	1.73	0.00	0.00	4.43	3.17	0.43	1.50
KMB-2-	420	22	76.36	13.05	1.40	0.31	0.00	4.17	2.87	0.16	1.68
KMB-2-	420	23	76.65	13.04	1.51	0.22	0.00	4.24	2.79	0.01	1.54
KMB-2-	420	24	77.00	12.36	1.59	0.19	0.00	3.91	3.01	0.41	1.53
KMB-2-	420	25	76.62	13.25	1.66	0.28	0.00	3.47	2.97	0.22	1.52
KMB-2-	420	26	76.18	12.90	1.78	0.32	0.09	4.12	3.02	0.18	1.42
KMB-2-	420	27	76.41	12.98	1.66	0.16	0.13	4.09	2.85	0.21	1.50
KMB-2-	420	28	76.72	12.60	1.56	0.32	0.13	4.13	2.82	0.27	1.45
KMB-2-	420	29	76.40	13.06	1.60	0.20	0.12	3.85	3.11	0.14	1.51
KMB-2-	420	30	76.32	13.14	1.65	0.05	0.00	4.09	3.16	0.12	1.48
KMB-2-	420	31	76.16	13.04	1.96	0.13	0.00	3.90	3.19	0.15	1.48
KMB-2-	420	32	76.59	12.92	1.44	0.15	0.00	3.41	3.70	0.00	1.78
KMB-2-	420	33	75.89	13.02	1.80	0.11	0.25	4.01	2.88	0.36	1.42
KMB-2-	420	34	75.75	13.01	1.77	0.47	0.16	3.80	3.13	0.08	1.84
KMB-2-	420	35	76.57	12.91	1.59	0.17	0.00	4.13	3.00	0.20	1.43
KMB-2-	420	36	76.66	12.88	1.41	0.18	0.00	4.13	2.90	0.34	1.50
KMB-2-	420	37	76.33	12.92	1.44	0.22	0.01	4.14	2.72	0.45	1.52
KMB-2-	420	38	76.16	12.77	1.76	0.20	0.18	3.84	3.02	0.45	1.61
KMB-2-	421	39	76.62	12.99	1.51	0.09	0.00	4.19	2.91	0.15	1.54
KMB-2-	421	40	75.24	13.29	1.72	0.23	0.34	4.14	2.99	0.22	1.58
KMB-2-	421	41	75.94	13.08	1.81	0.09	0.21	3.92	3.21	0.00	1.45
KMB-2-	421	44	76.76	12.89	1.56	0.14	0.00	4.00	3.08	0.21	1.35
KMB-2-	421	45	75.65	13.00	1.39	0.20	0.25	4.17	3.21	0.45	1.68
KMB-2-	421	46	76.61	12.77	1.21	0.15	0.10	4.02	3.04	0.37	1.48
KMB-2-	421	49	76.18	13.05	1.88	0.16	0.00	4.15	2.86	0.12	1.59
KMB-2-	421	50	76.95	12.65	1.51	0.21	0.06	4.24	2.83	0.16	1.39
KMB-2-	421	51	76.22	13.12	1.48	0.21	0.00	4.43	3.11	0.14	1.28
KMB-2-	421	52	76.74	13.17	1.49	0.17	0.00	3.21	3.35	0.25	1.62
KMB-2-	421	54	76.20	13.15	1.45	0.22	0.53	4.07	2.83	0.03	1.52
KMB-2-	421	55	76.09	13.12	1.53	0.15	0.03	4.28	2.81	0.31	1.42
KMB-2-	421	56	76.57	12.96	1.26	0.09	0.06	3.83	3.22	0.02	1.72
KMB-2-	421	57	76.55	12.99	1.49	0.14	0.24	4.01	3.10	0.00	1.48
KMB-2-	421	58	75.53	13.28	1.86	0.23	0.05	4.20	3.14	0.40	1.31
KMB-2-	421	59	76.05	12.79	1.79	0.06	0.12	3.93	3.17	0.42	1.67
KMB-2-	421	60	76.36	13.18	1.60	0.09	0.07	4.10	3.07	0.21	1.31
KMB-2-	421	61	76.12	13.08	1.69	0.13	0.00	3.82	3.03	0.29	1.60
KMB-2-	421	62	76.59	12.94	1.64	0.22	0.14	3.96	3.05	0.12	1.35
KMB-2-	421	63	76.51	13.34	0.99	0.18	0.09	3.96	3.02	0.25	1.65
KMB-2-	422	66	75.92	13.30	1.68	0.21	0.02	4.20	2.83	0.13	1.46
KMB-2-	422	67	76.16	13.27	1.60	0.08	0.17	4.07	3.03	0.28	1.33
KMB-2-	422	68	76.41	13.22	1.30	0.27	0.00	4.00	3.08	0.36	1.36
KMB-2-	422	69	76.27	13.29	1.60	0.16	0.04	3.74	3.15	0.09	1.67
KMB-2-	422	70	76.41	12.86	1.28	0.21	0.33	3.84	2.95	0.38	1.45
KMB-2-	422	71	75.59	12.92	1.80	0.23	0.07	3.90	3.26	0.30	1.56
KMB-2-	422	72	76.68	13.08	1.58	0.03	0.16	3.93	2.91	0.30	1.34
KMB-2-	422	73	76.66	13.10	1.58	0.20	0.07	3.85	3.06	0.02	1.46
KMB-2-	422	74	76.32	12.97	1.79	0.18	0.01	3.91	3.19	0.22	1.41
KMB-2-	422	75	76.44	13.21	1.23	0.25	0.00	4.16	2.81	0.27	1.62
KMB-2-	422	76	76.91	12.95	1.62	0.00	0.00	3.44	3.60	0.04	1.44
KMB-2-	422	77	76.46	12.80	1.61	0.15	0.06	4.29	2.98	0.18	1.46
KMB-2-	422	78	76.75	12.98	1.30	0.22	0.04	4.14	2.98	0.18	1.18
KMB-2-	422	79	76.16	13.14	1.53	0.31	0.00	4.23	3.09	0.17	1.36
KMB-2-	422	80	76.70	12.83	1.78	0.24	0.17	3.15	3.23	0.00	1.63
KMB-2-	422	81	76.33	13.01	1.24	0.20	0.22	4.31	2.98	0.22	1.48
KMB-2-	422	82	76.56	12.80	1.44	0.08	0.10	4.45	2.79	0.07	1.44
KMB-2-	422	83	76.35	12.84	1.46	0.29	0.40	3.98	2.93	0.30	1.44
KMB-2-	422	84	76.31	13.01	1.55	0.15	0.00	3.89	3.24	0.33	1.52
KMB-2-	422	85	75.90	12.70	1.95	0.00	0.00	4.28	2.95	0.48	1.44
KMB-2-	422	86	76.68	12.55	1.57	0.22	0.09	3.88	2.91	0.16	1.69
KMB-2-	422	87	76.40	13.05	1.59	0.27	0.00	3.97	3.12	0.22	1.36
KMB-2-	422	88	76.68	13.23	1.29	0.19	0.00	4.04	2.90	0.18	1.49
KMB-2-	422	89	64.90	21.11	0.98	0.11	0.09	5.17	1.50	0.29	5.85
KMB-2-	422	90	76.23	13.14	1.39	0.24	0.09	4.16	3.04	0.19	1.29
KMB-2-	422	91	76.11	13.01	1.73	0.23	0.04	4.20	3.19	0.00	1.49
KMB-2-	422	92	77.26	12.65	1.37	0.13	0.00	2.93	3.66	0.00	1.73
KMB-2-	423	93	75.69	12.59	1.88	0.31	0.32	4.04	2.97	0.44	1.46
KMB-2-	423	94	75.80	12.89	1.88	0.19	0.00	4.30	2.96	0.16	1.57
KMB-2-	423	95	76.31	13.17	1.47	0.11	0.06	4.00	3.06	0.23	1.59

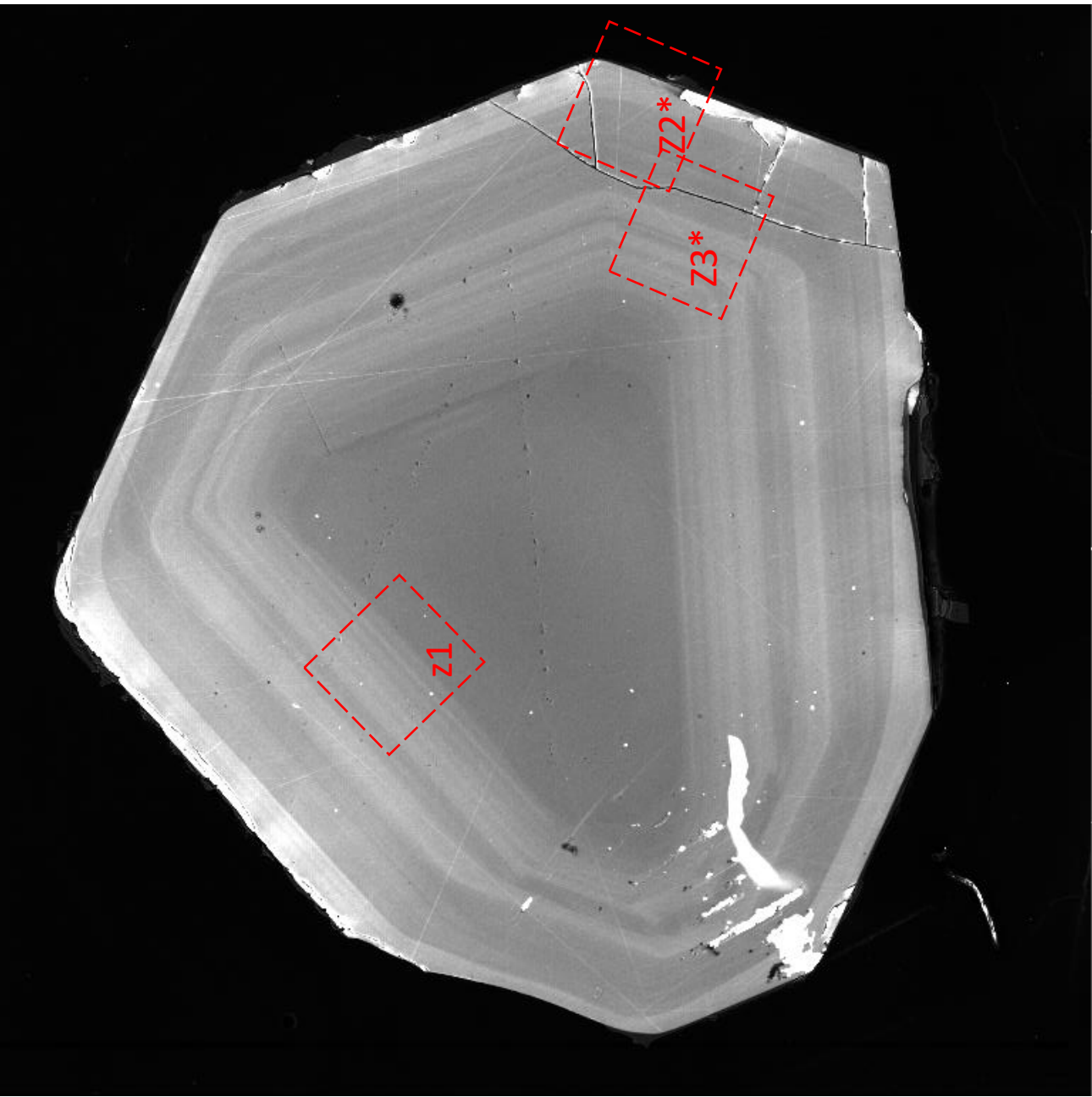
付録1. 火山ガラスの主成分元素データ

Sample	Pumice	Analysis	SiO ₂	Al ₂ O ₃	FeO	MgO	MnO	Na ₂ O	K ₂ O	TiO ₂	CaO
KMB-2-	430	378	76.96	12.52	1.07	0.19	0.45	4.13	2.88	0.40	1.41
KMB-2-	430	379	76.40	12.50	1.89	0.20	0.25	3.94	3.11	0.27	1.44
KMB-2-	430	380	77.15	12.93	1.39	0.08	0.12	3.87	3.10	0.06	1.31
KMB-2-	430	381	76.85	12.63	1.53	0.15	0.00	4.39	2.95	0.14	1.35
KMB-2-	430	382	77.05	12.46	1.28	0.02	0.27	4.31	2.95	0.10	1.28
KMB-2-	430	383	75.86	12.87	1.94	0.12	0.34	4.14	2.85	0.20	1.44
KMB-2-	430	385	76.62	12.52	1.39	0.17	0.19	4.25	3.19	0.08	1.59

TOKM-1-212-1

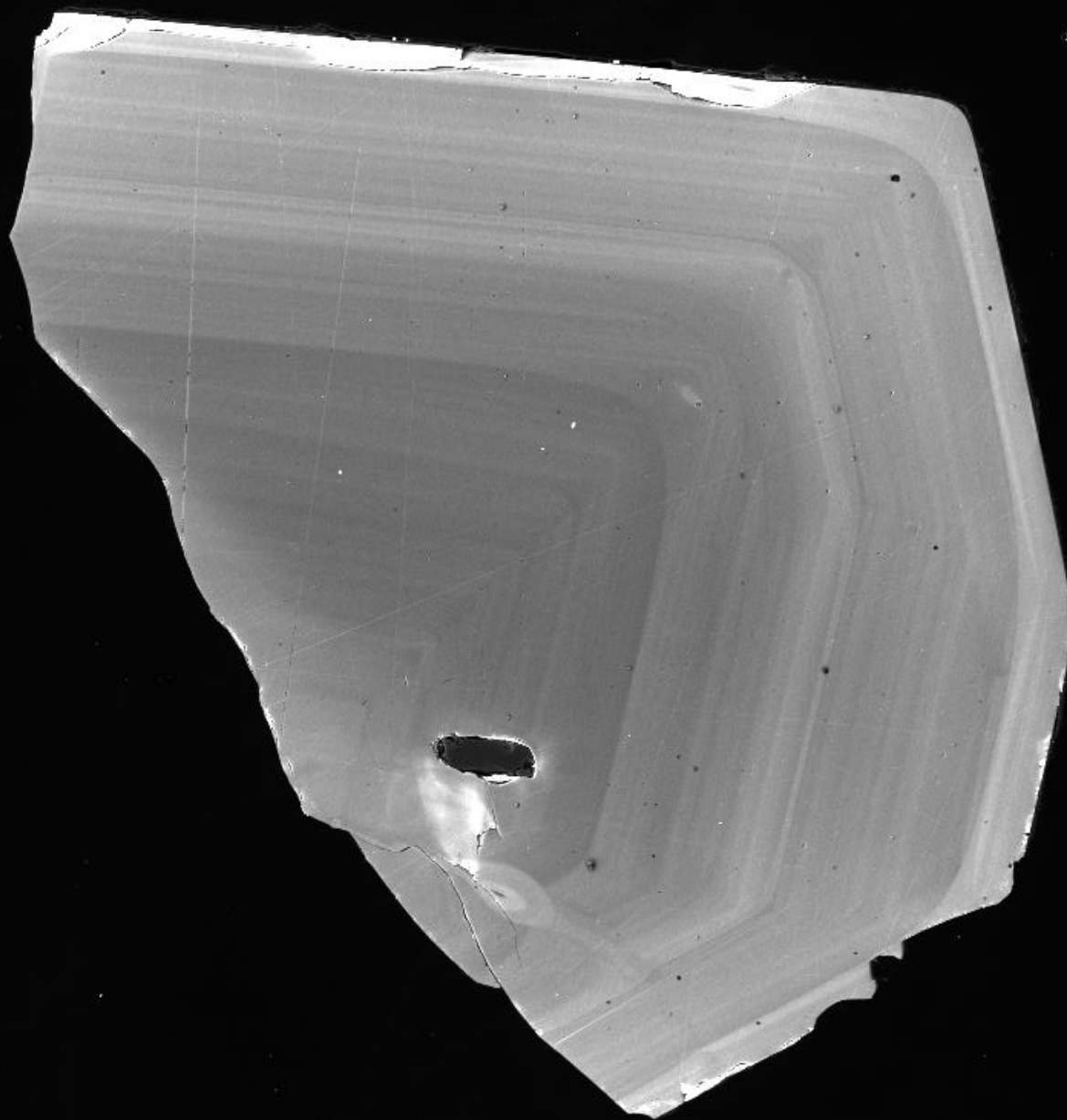


TOKM-1-212-2



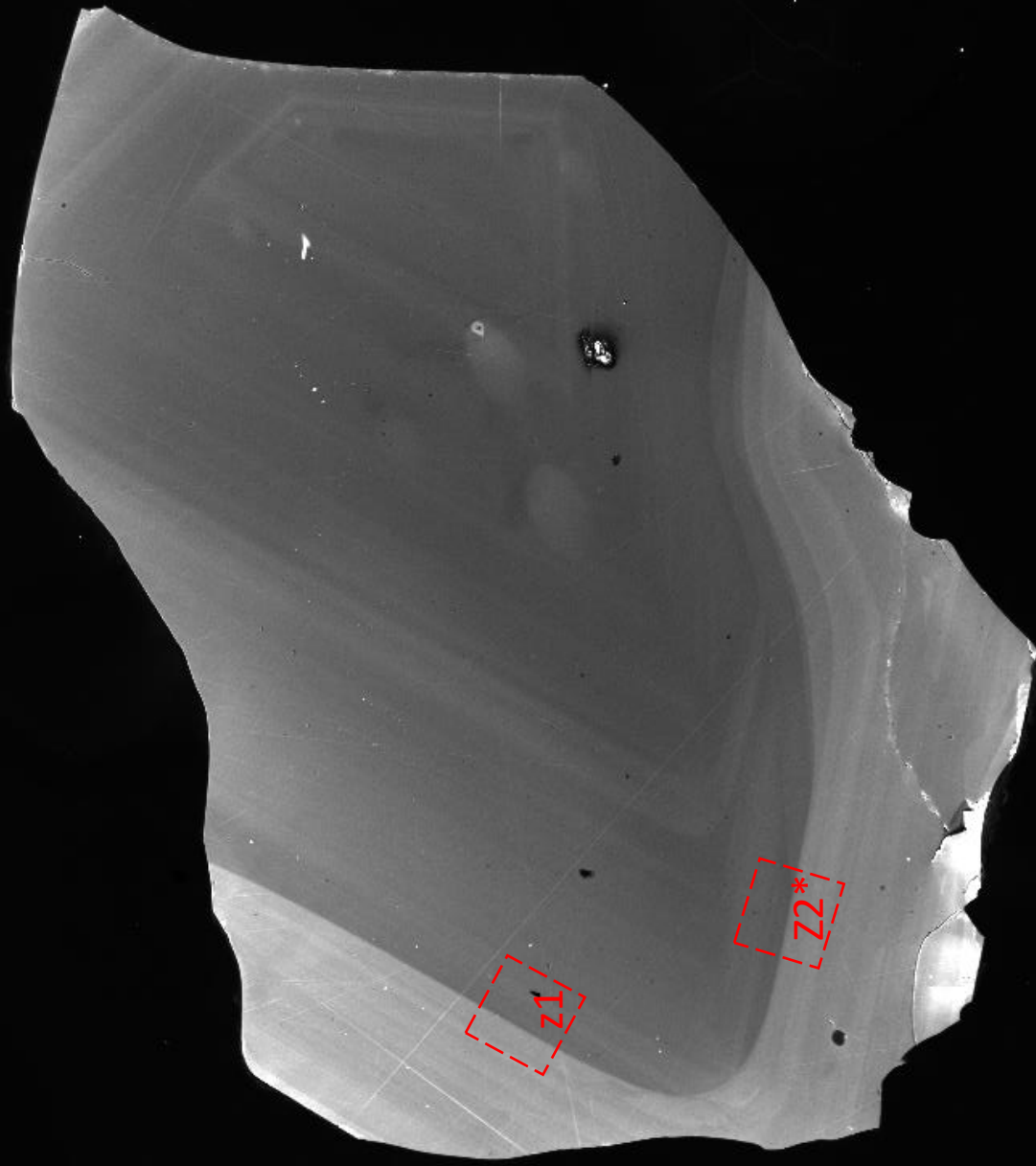
SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.72 mm	Det: CL	500 μm
BI: 19.00	Date(m/d/y): 06/07/18	Vanderbilt Univ EES

TOKM-1-212-3



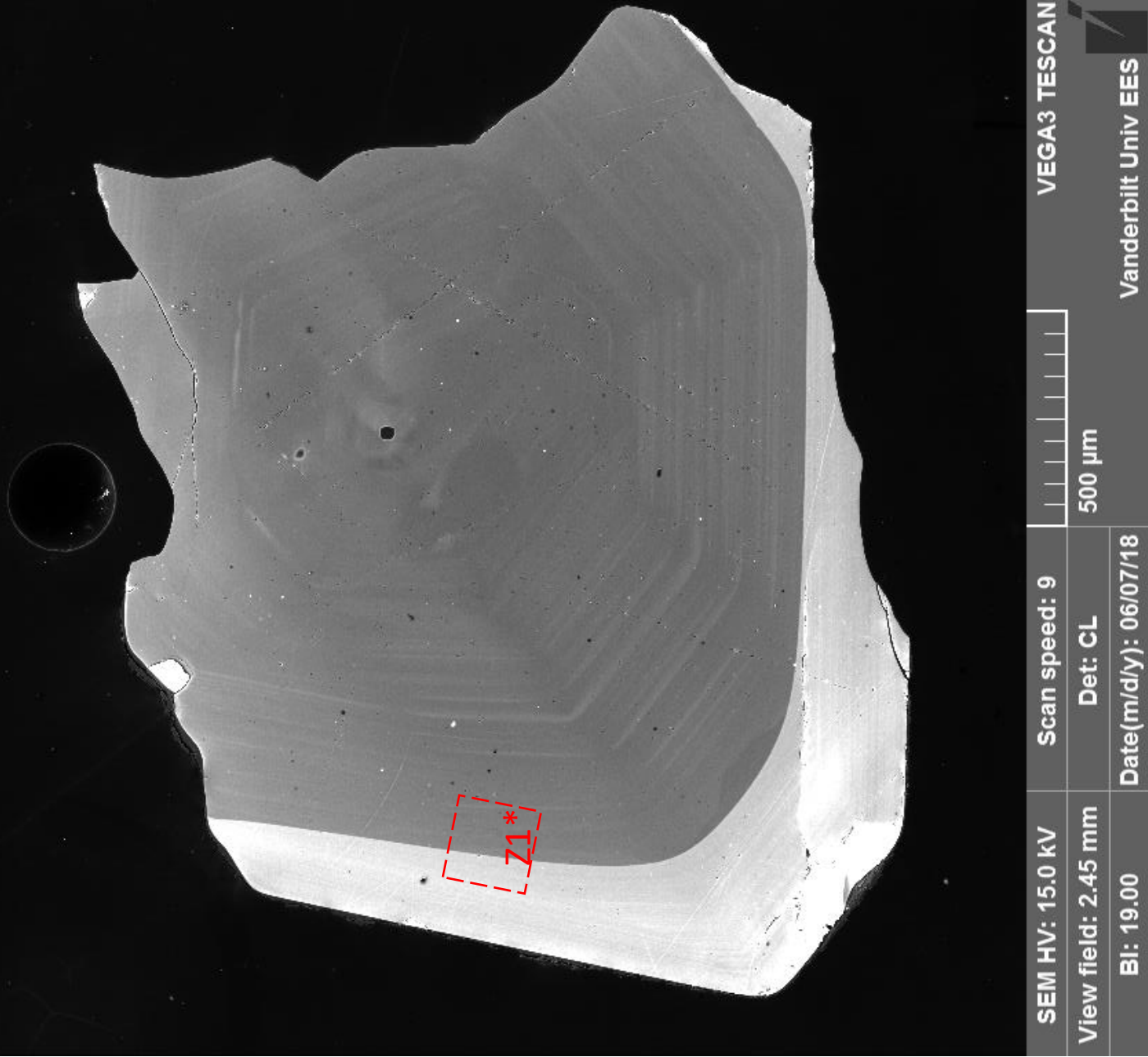
SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.96 mm	Det: CL	500 μm
BI: 19.00	Date(m/d/y): 06/07/18	Vanderbilt Univ EES

TOKM-1-212-4

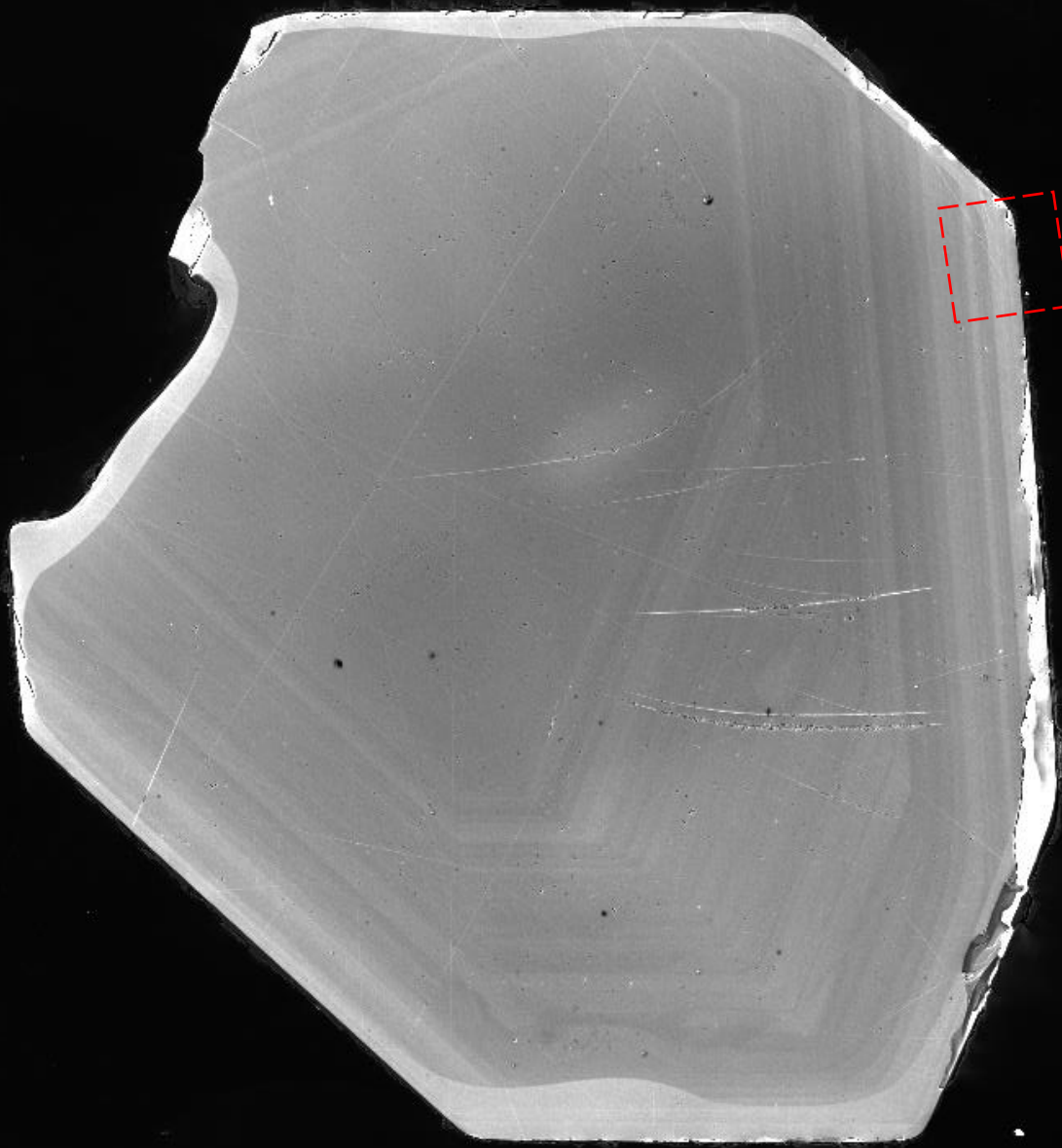


SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 2.78 mm	Det: CL	500 µm
BI: 19.00	Date(m/d/y): 06/07/18	Vanderbilt Univ EES

TOKM-1-212-5

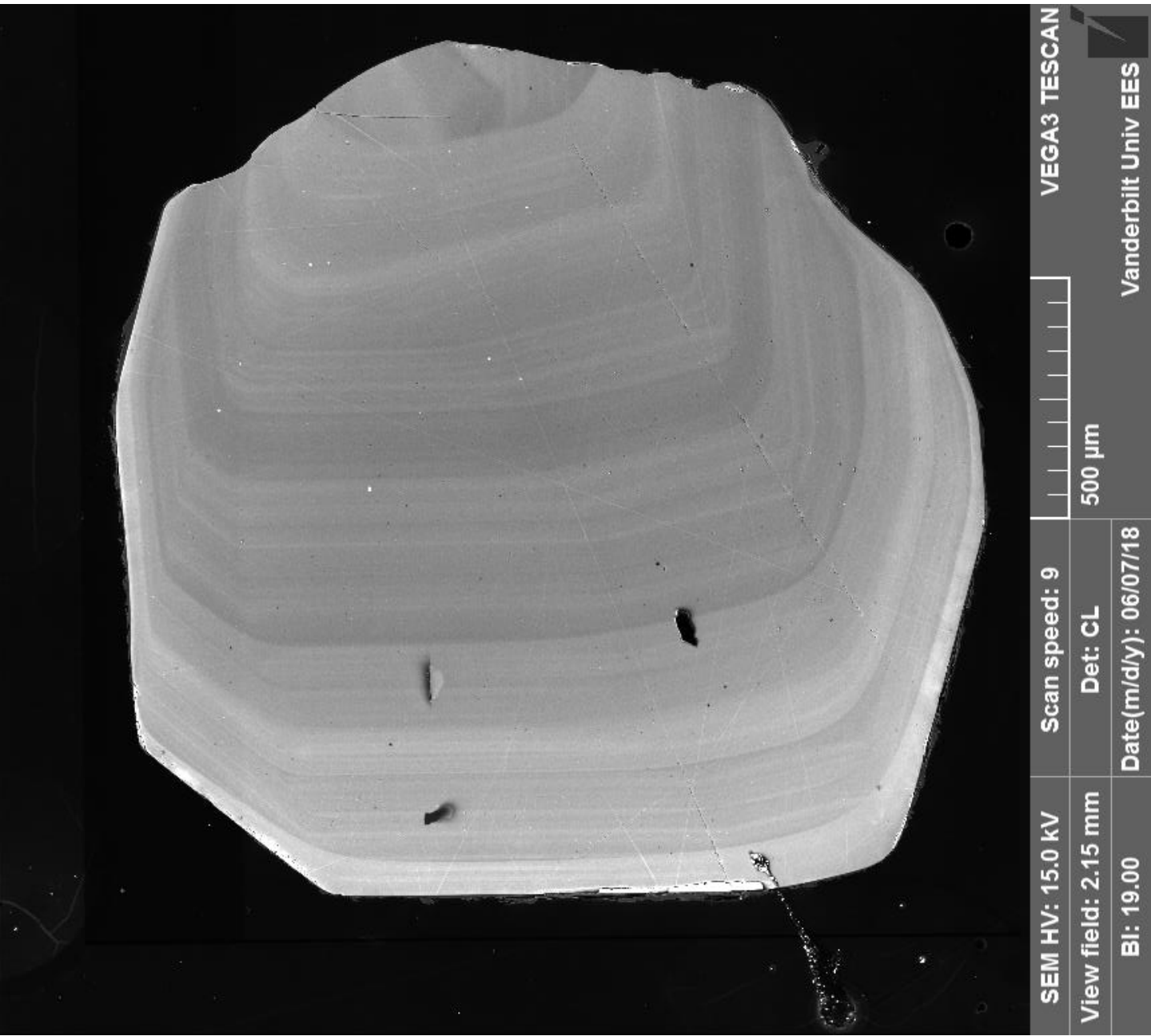


TOKM-1-212-6

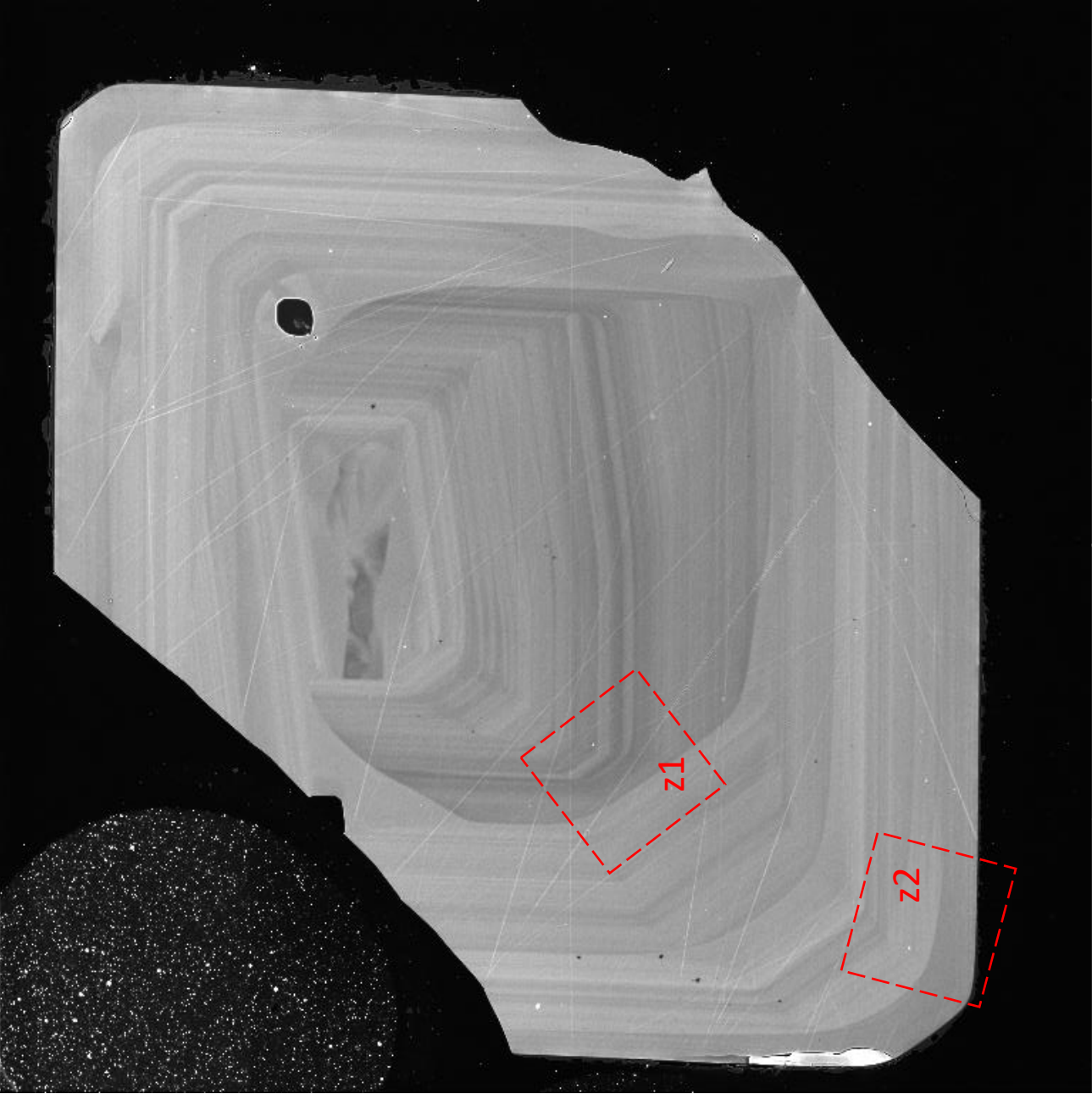


SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 2.19 mm	Det: CL	500 μm
BI: 19.00	Date(m/d/y): 06/07/18	Vanderbilt Univ EES

TOKM-1-212-7

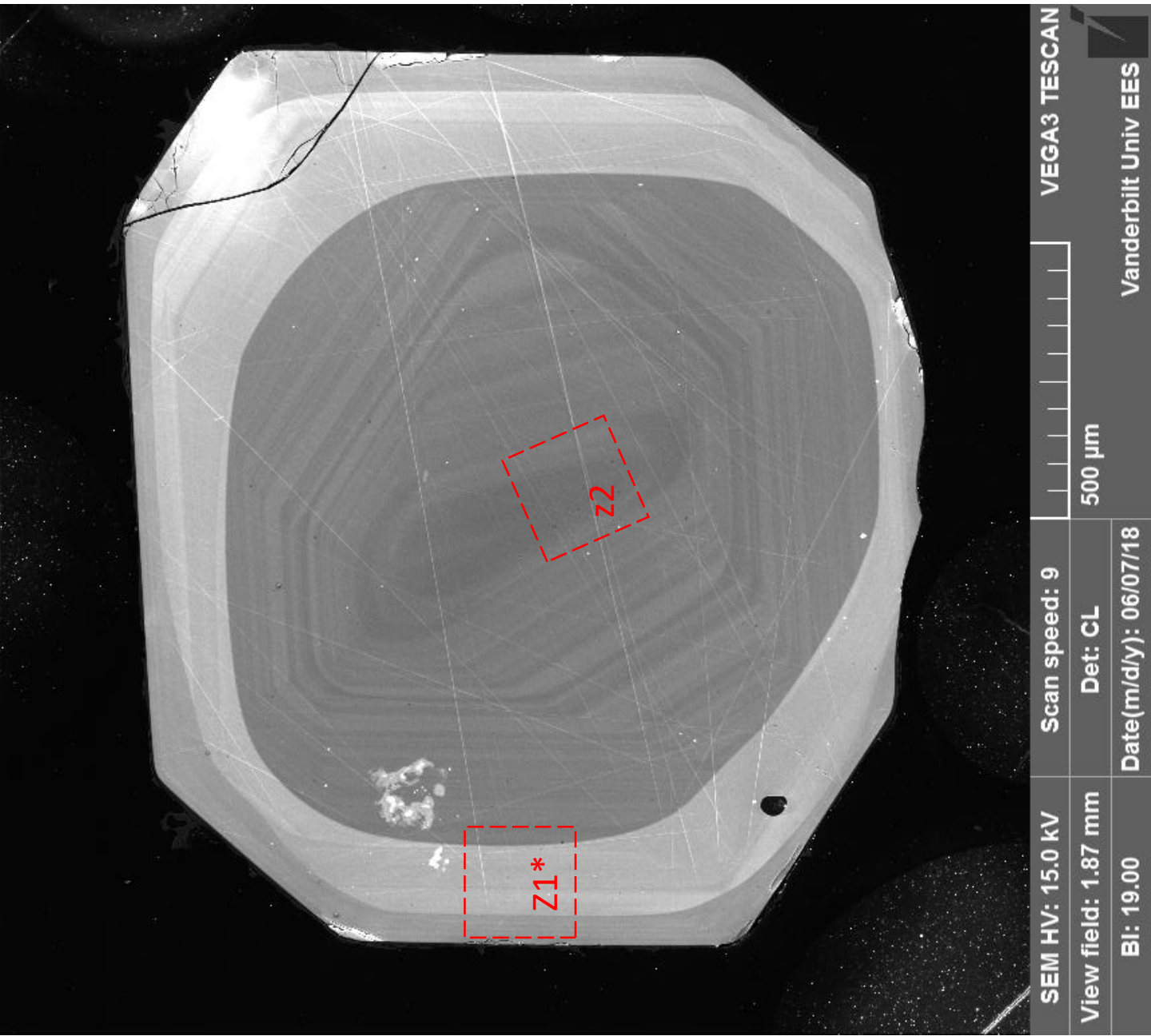


TOKM-1-212-8

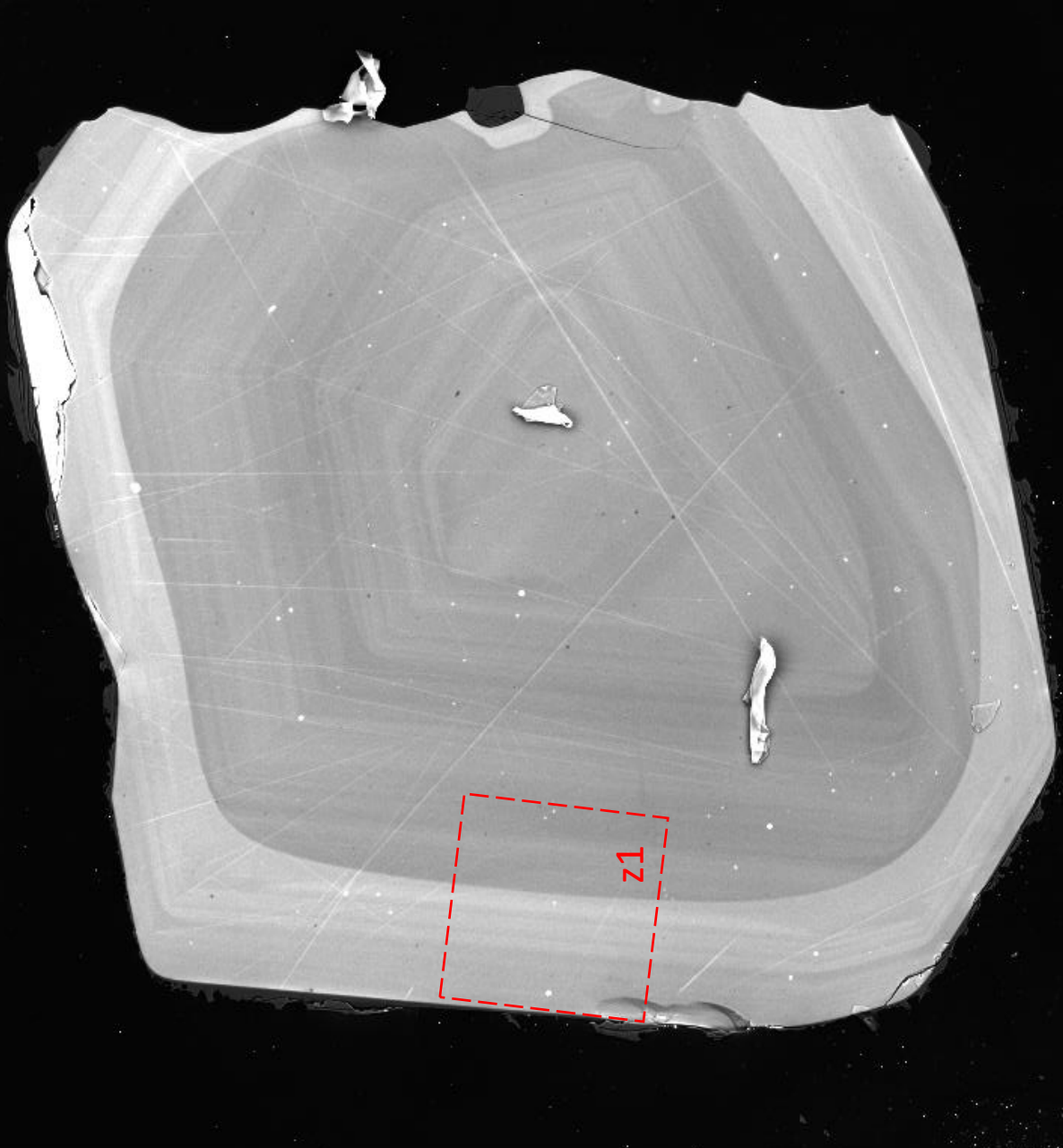


SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.50 mm	Det: CL	Vanderbilt Univ EES
BI: 19.00	Date(m/d/y): 06/07/18	

TOKM-1-212-9



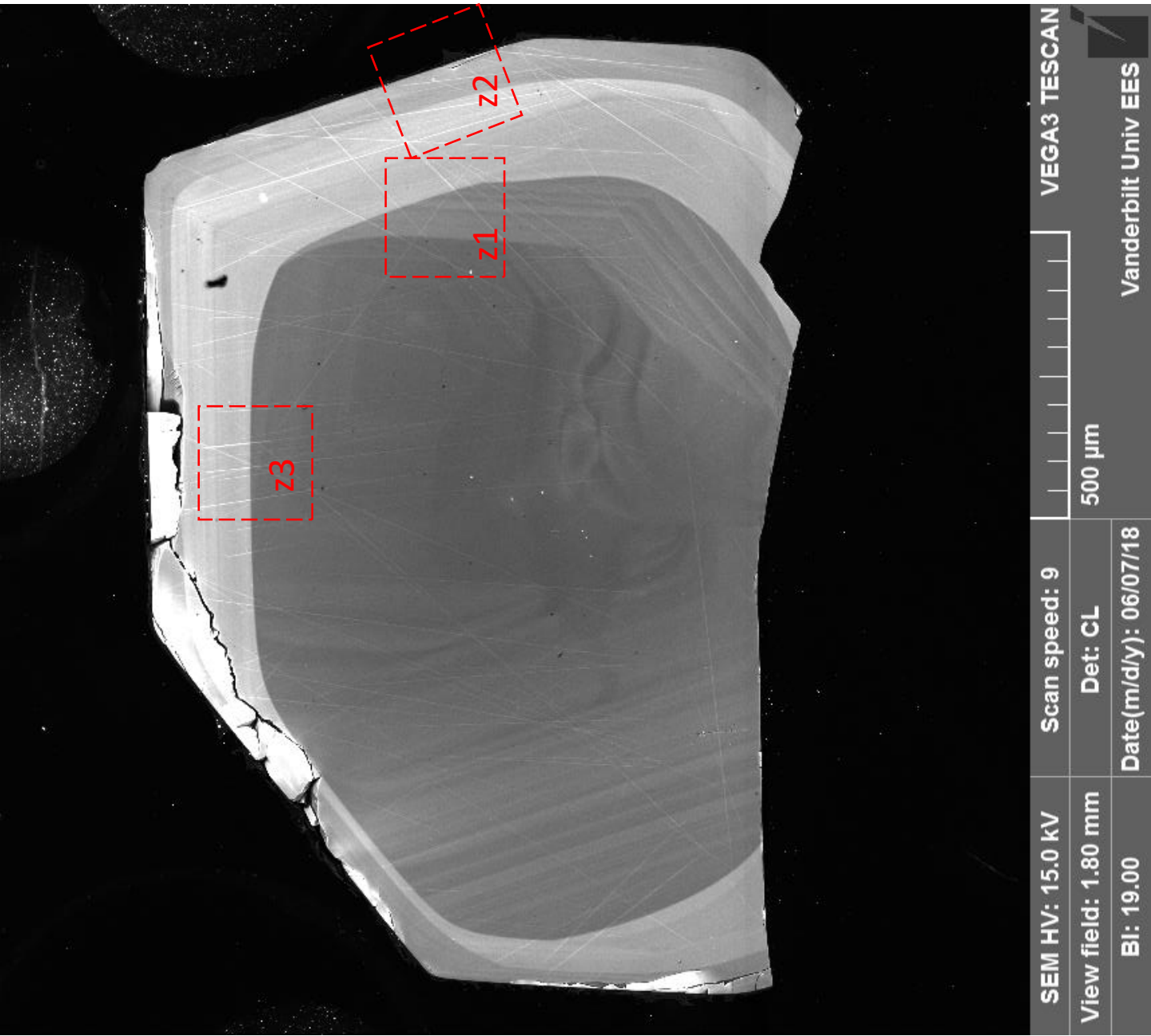
TOKM-1-212-10



SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.13 mm	Det: CL	Vanderbilt Univ EES
BI: 19.00	Date(m/d/y): 06/07/18	

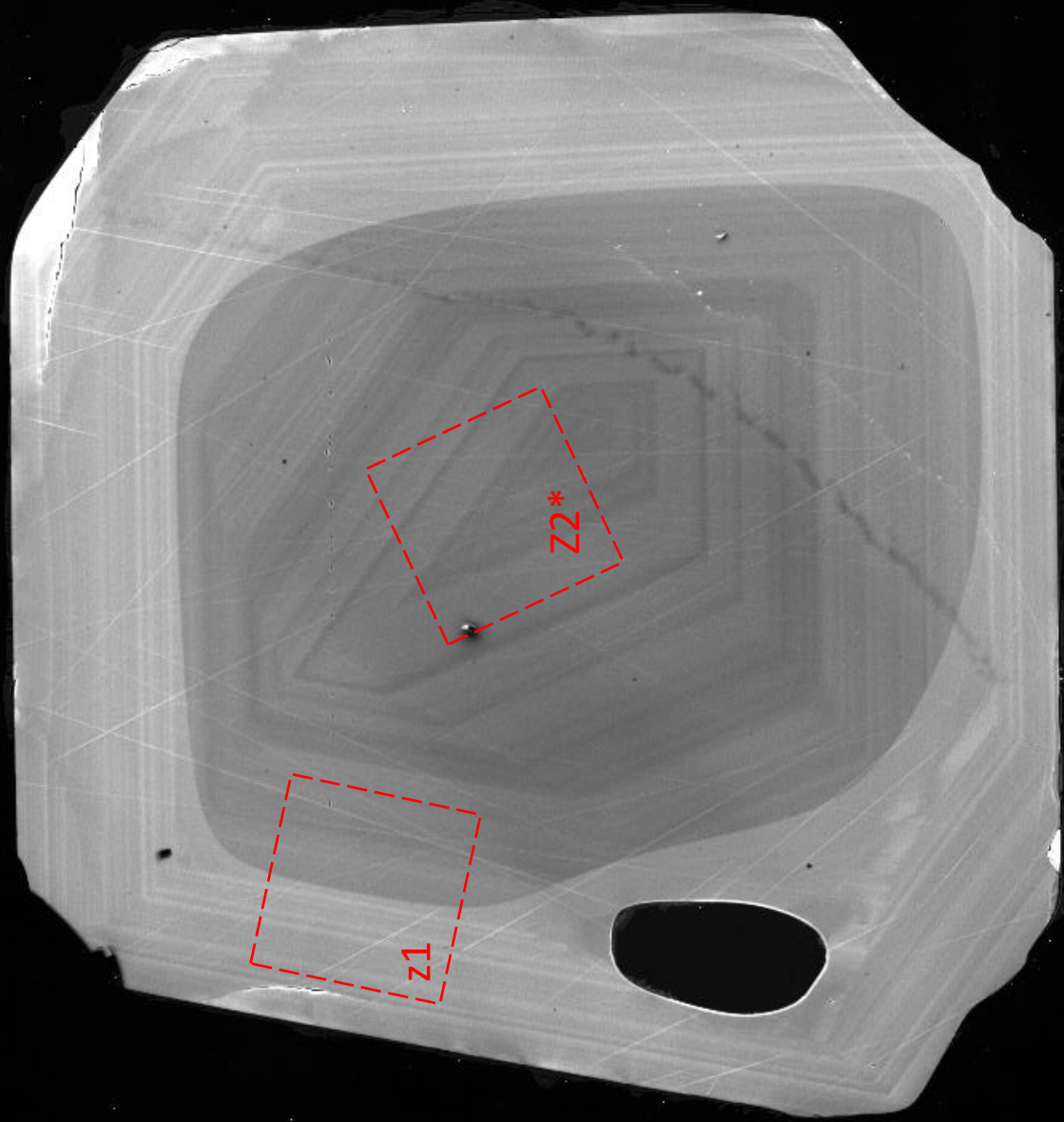
200 μm

TOKM-1-212-11



SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.80 mm	Det: CL	500 μm
BI: 19.00	Date(m/d/y): 06/07/18	Vanderbilt Univ EES

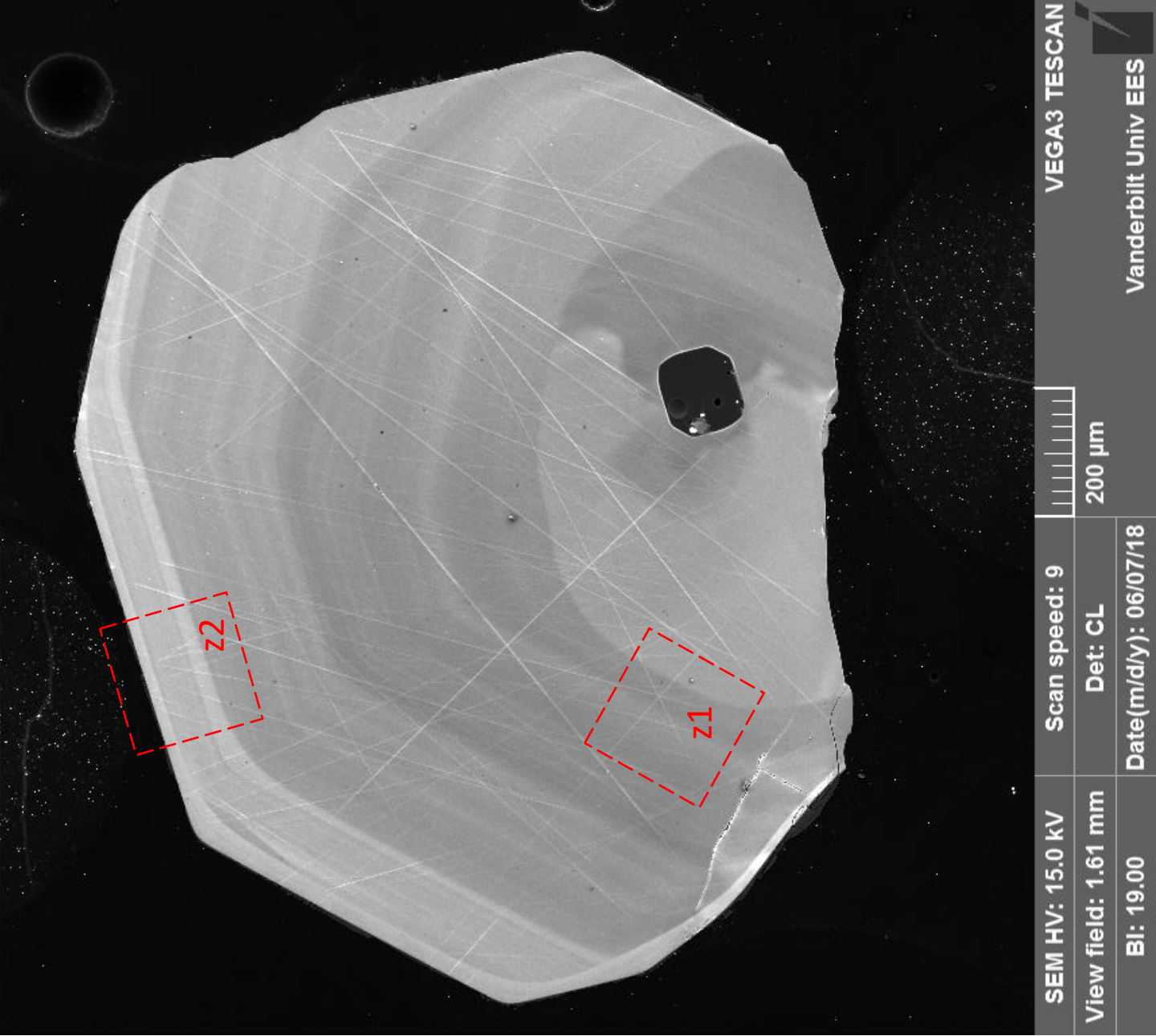
TOKM-1-212-12



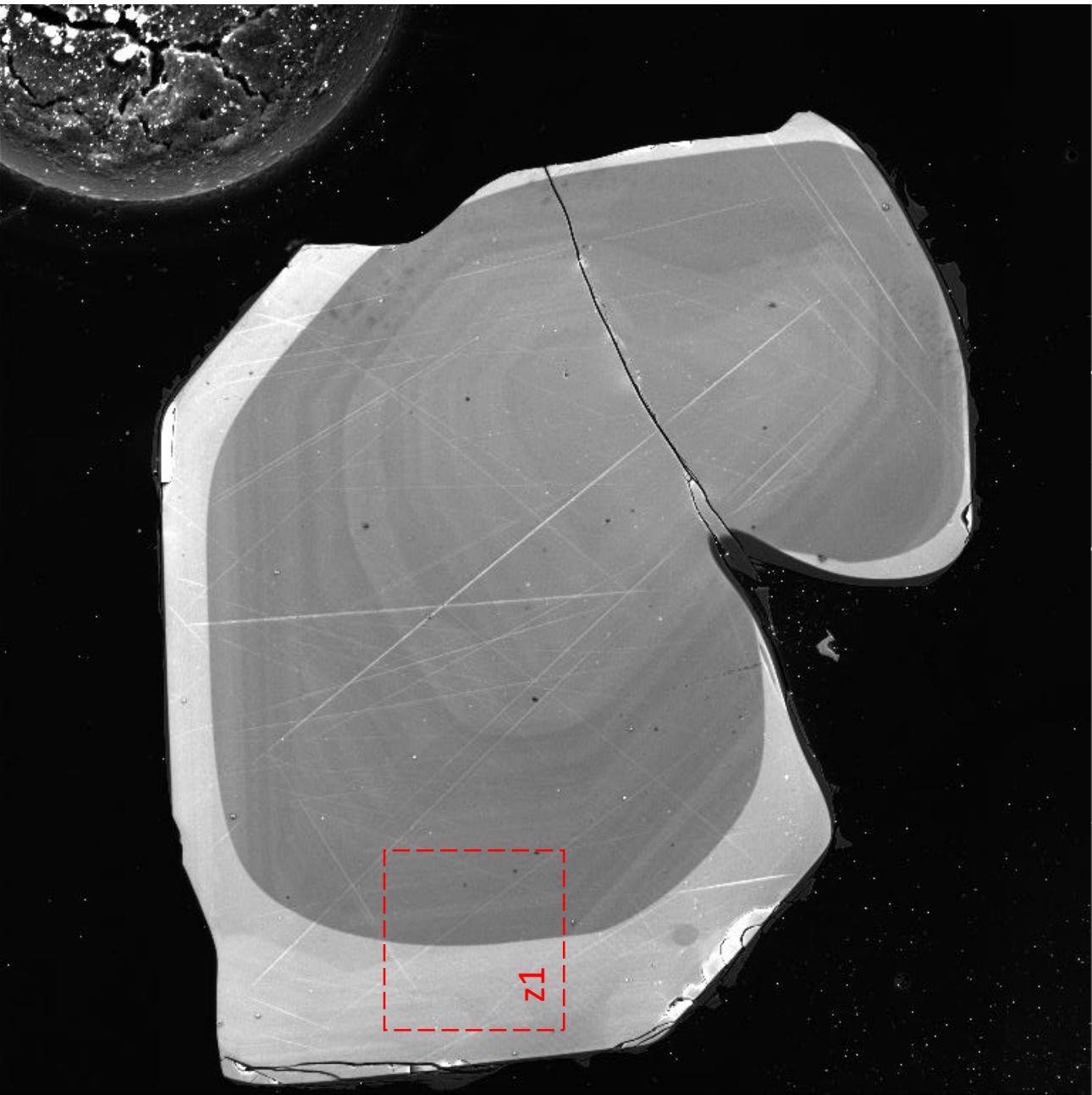
SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.24 mm	Det: CL	Vanderbilt Univ EES
BI: 19.00	Date(m/d/y): 06/07/18	

200 μm

TOKM-1-212-13

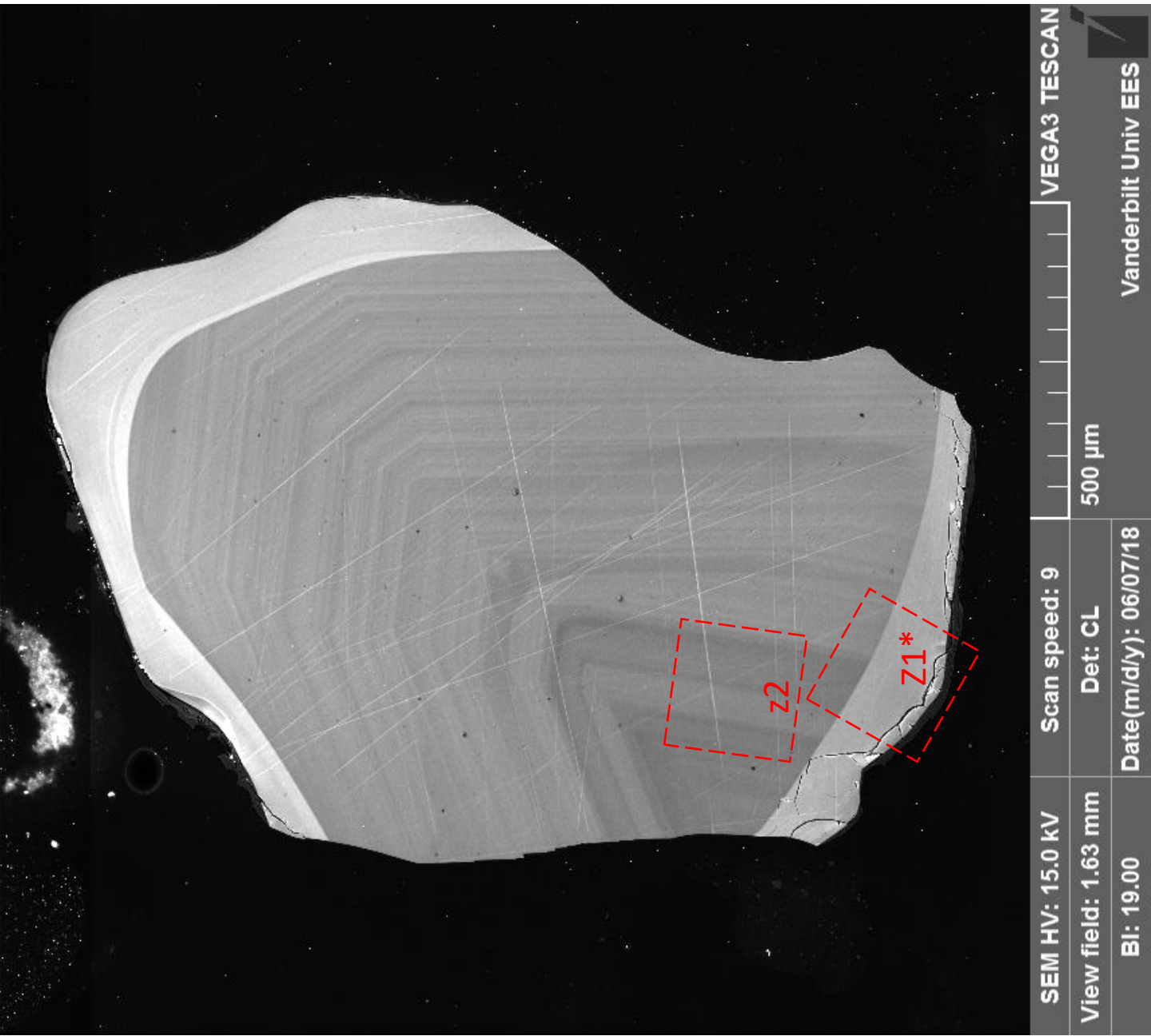


TOKM-1-212-14

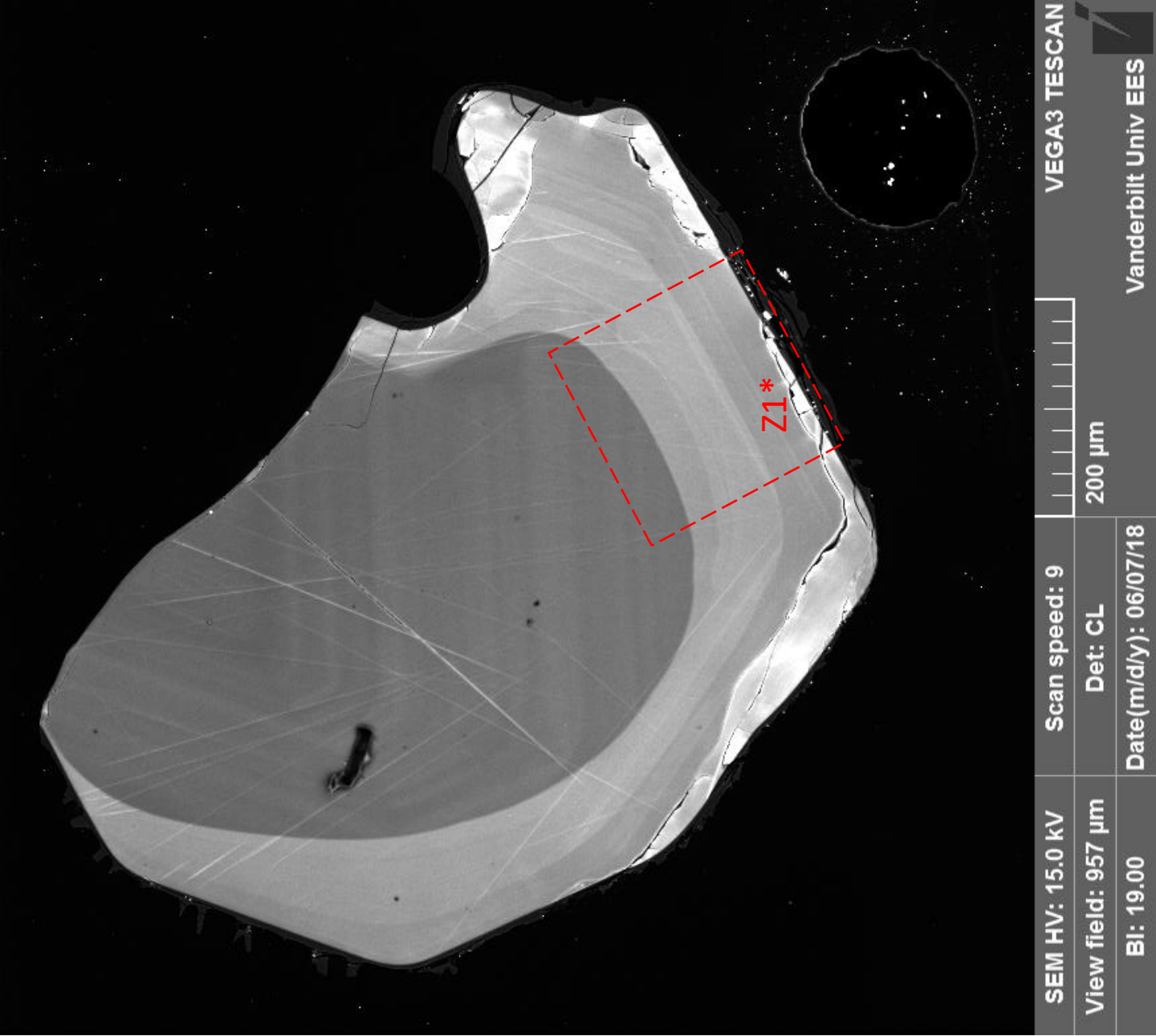


SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.24 mm	Det: CL	Vanderbilt Univ EES
BI: 19.00	Date(m/d/y): 06/07/18	

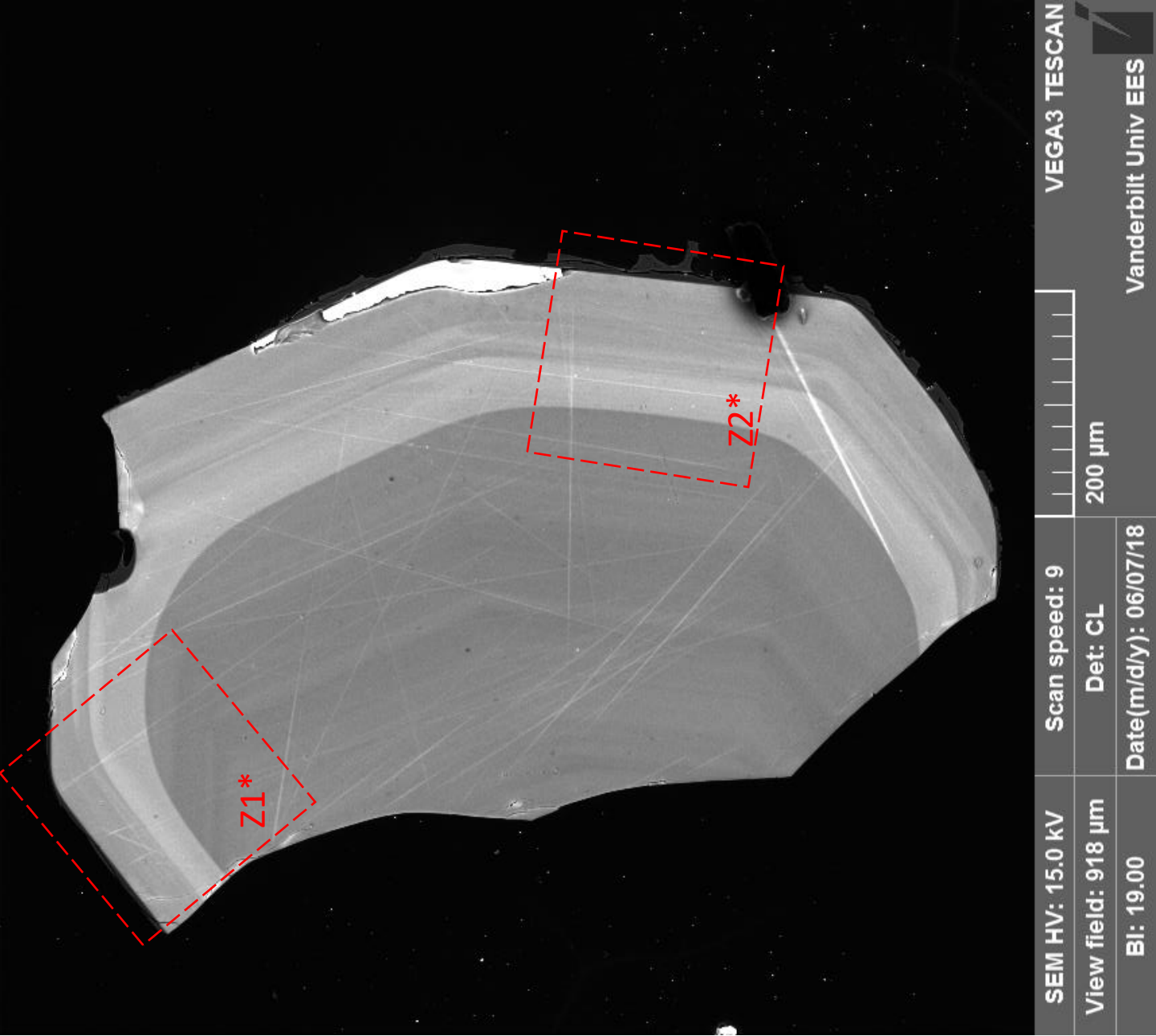
TOKM-1-212-15



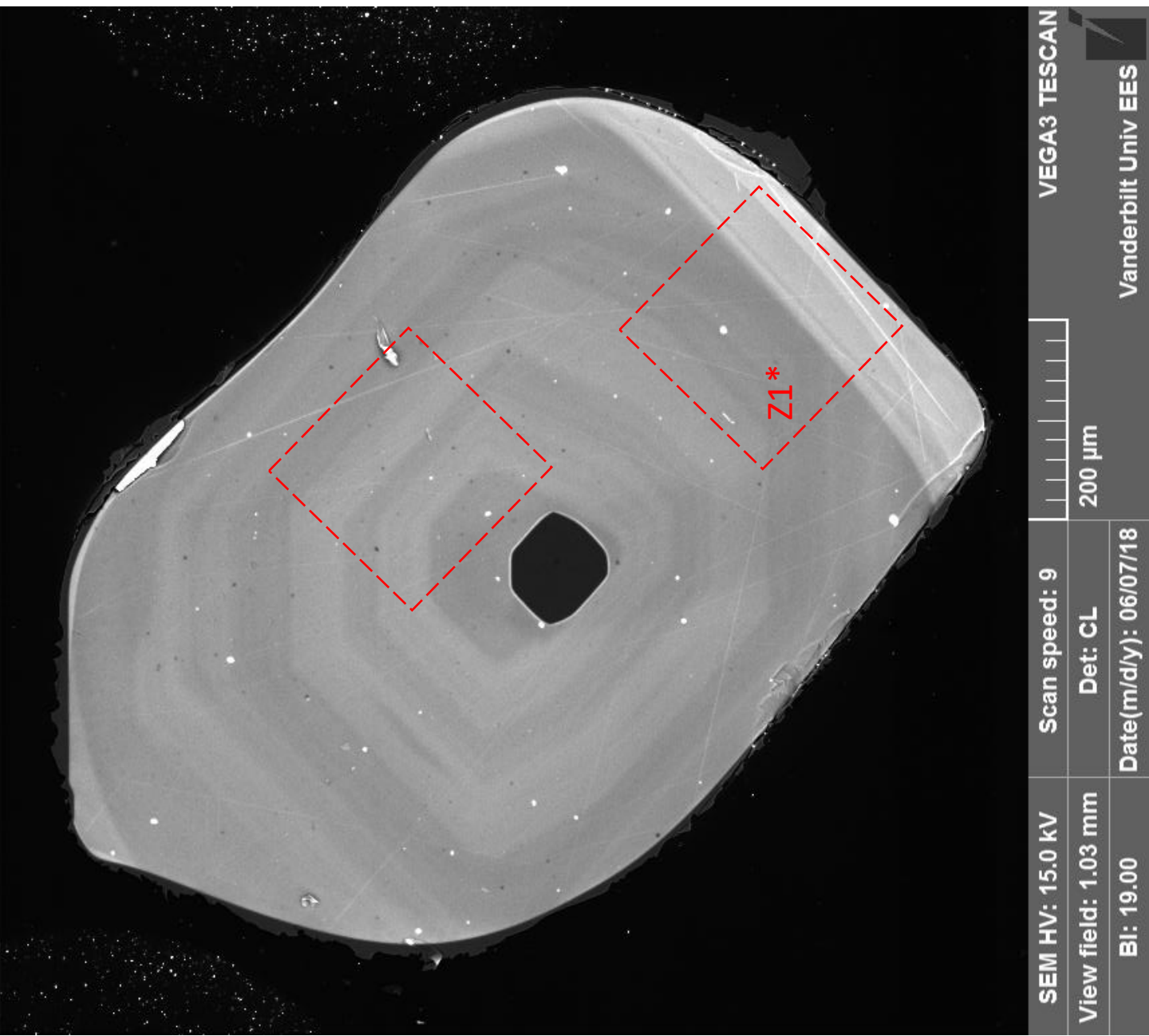
TOKM-1-212-16



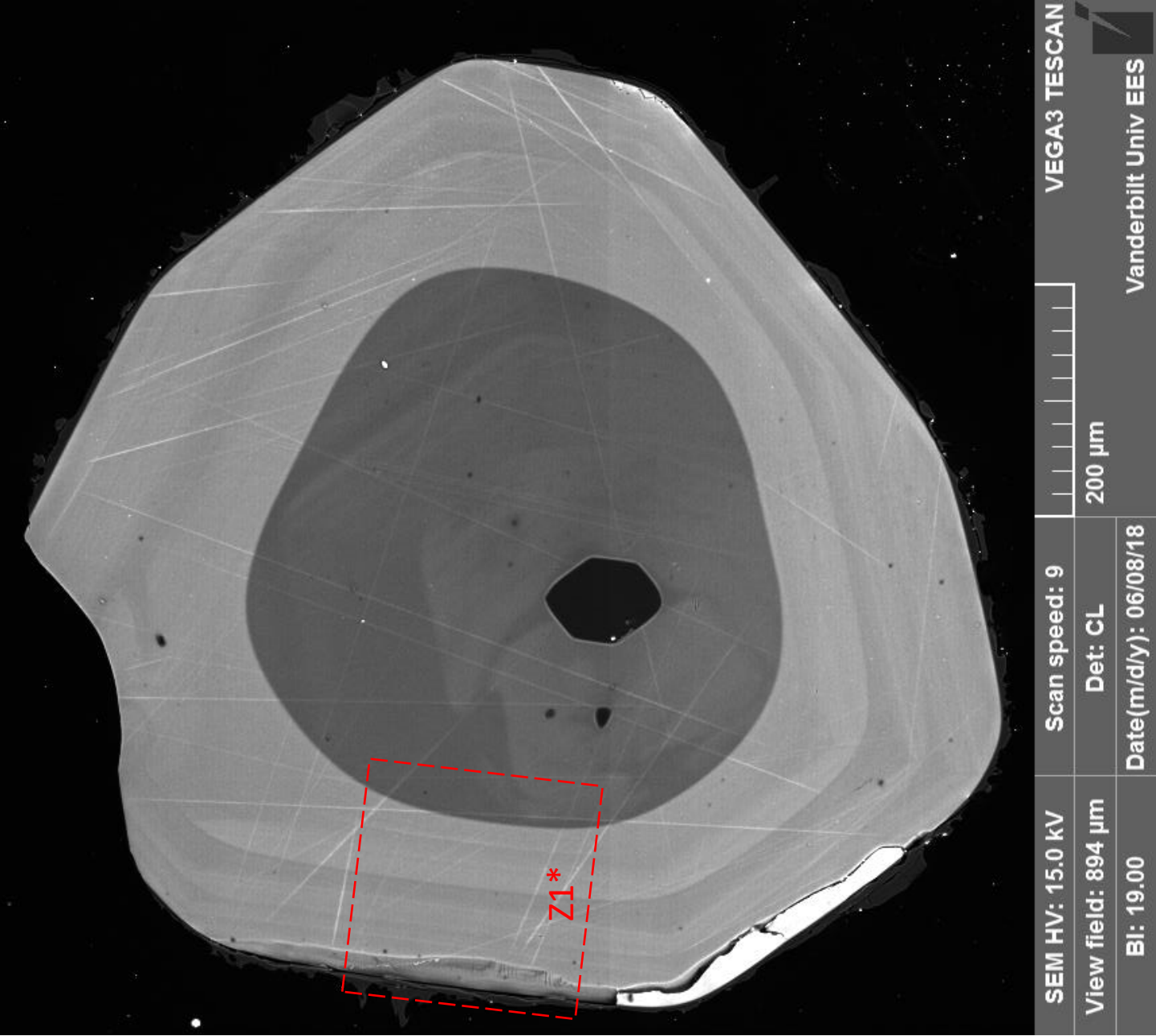
TOKM-1-212-17



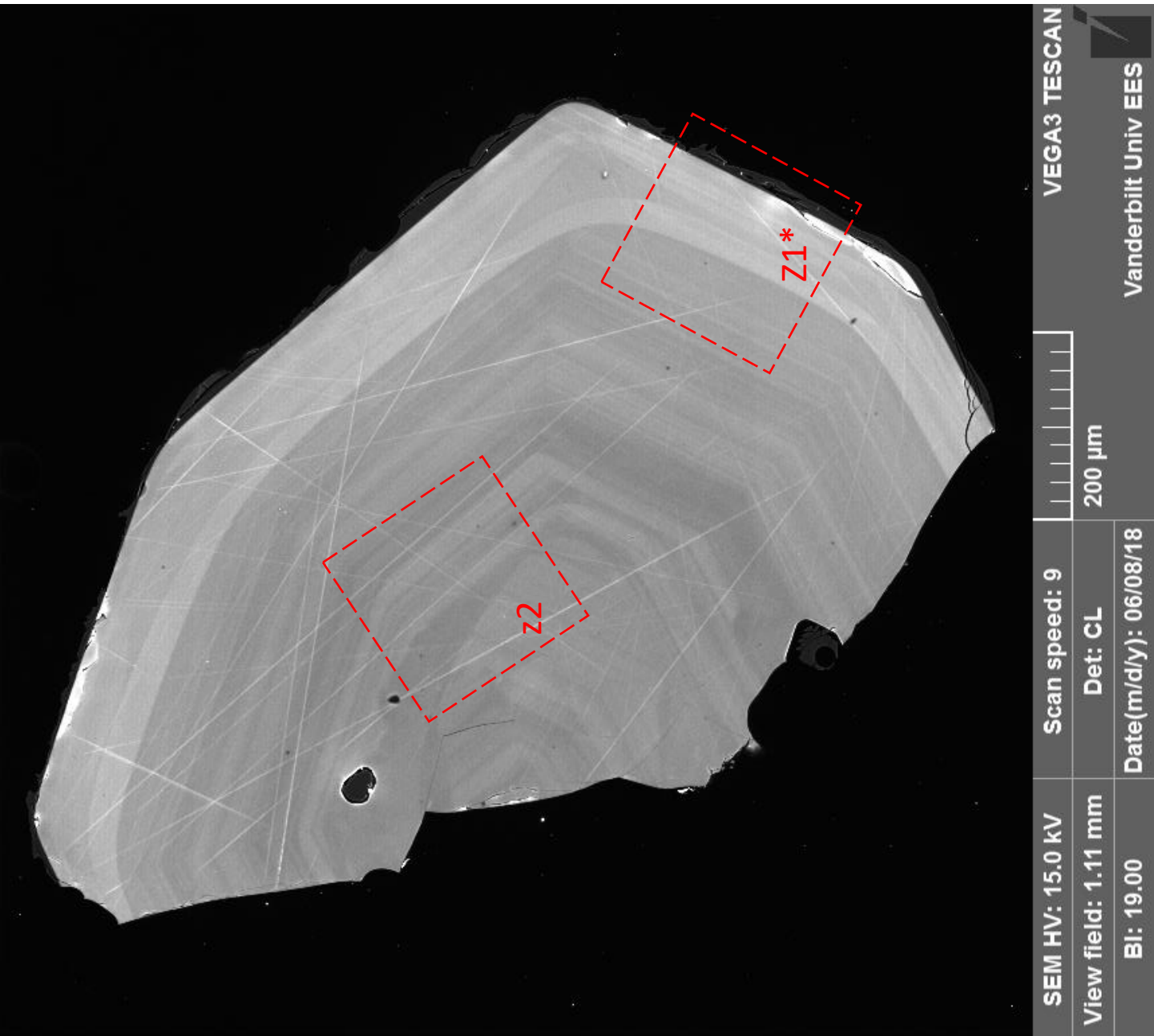
TOKM-1-212-18



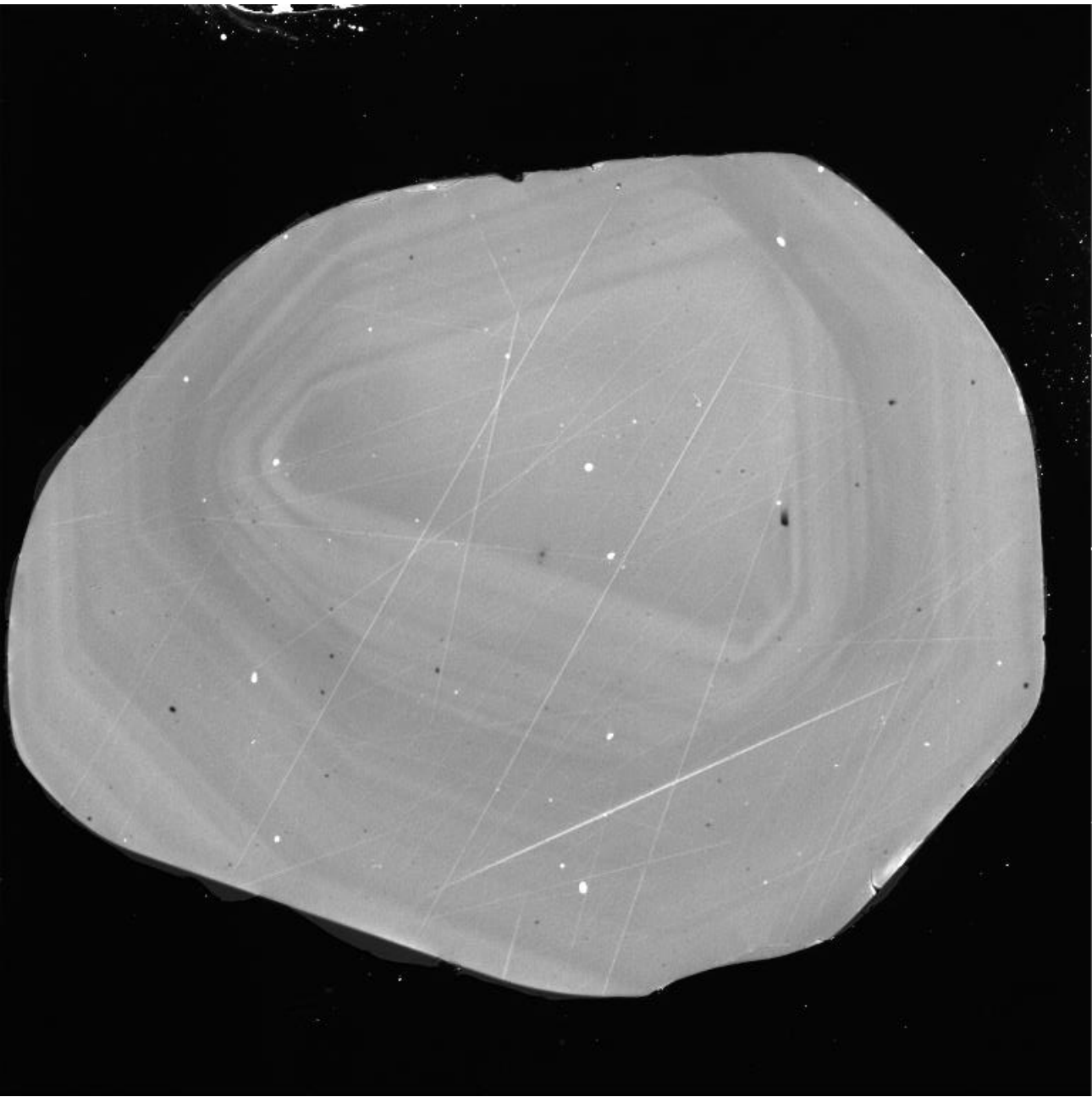
TOKM-1-212-19



TOKM-1-212-20



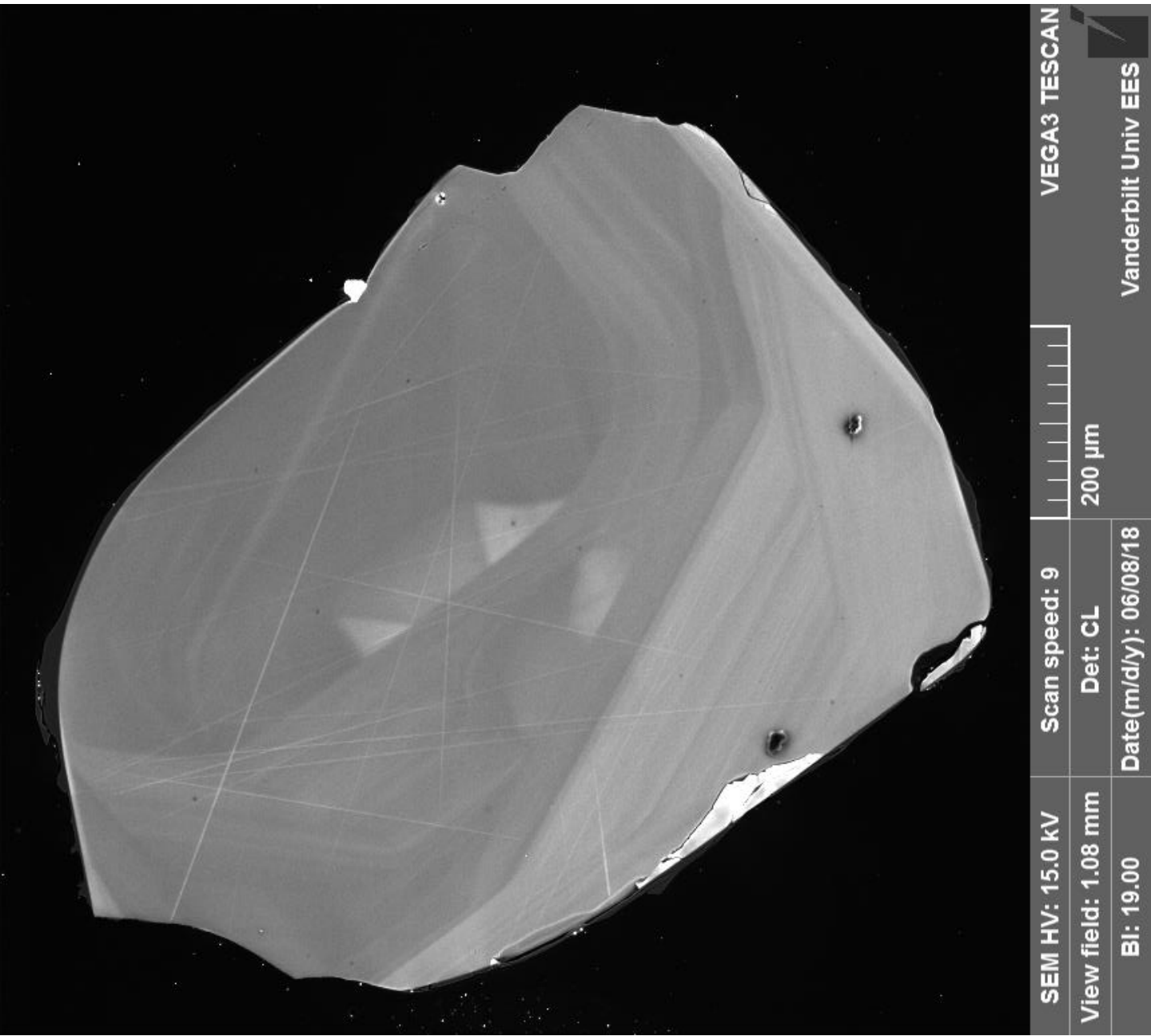
TOKM-1-212-21



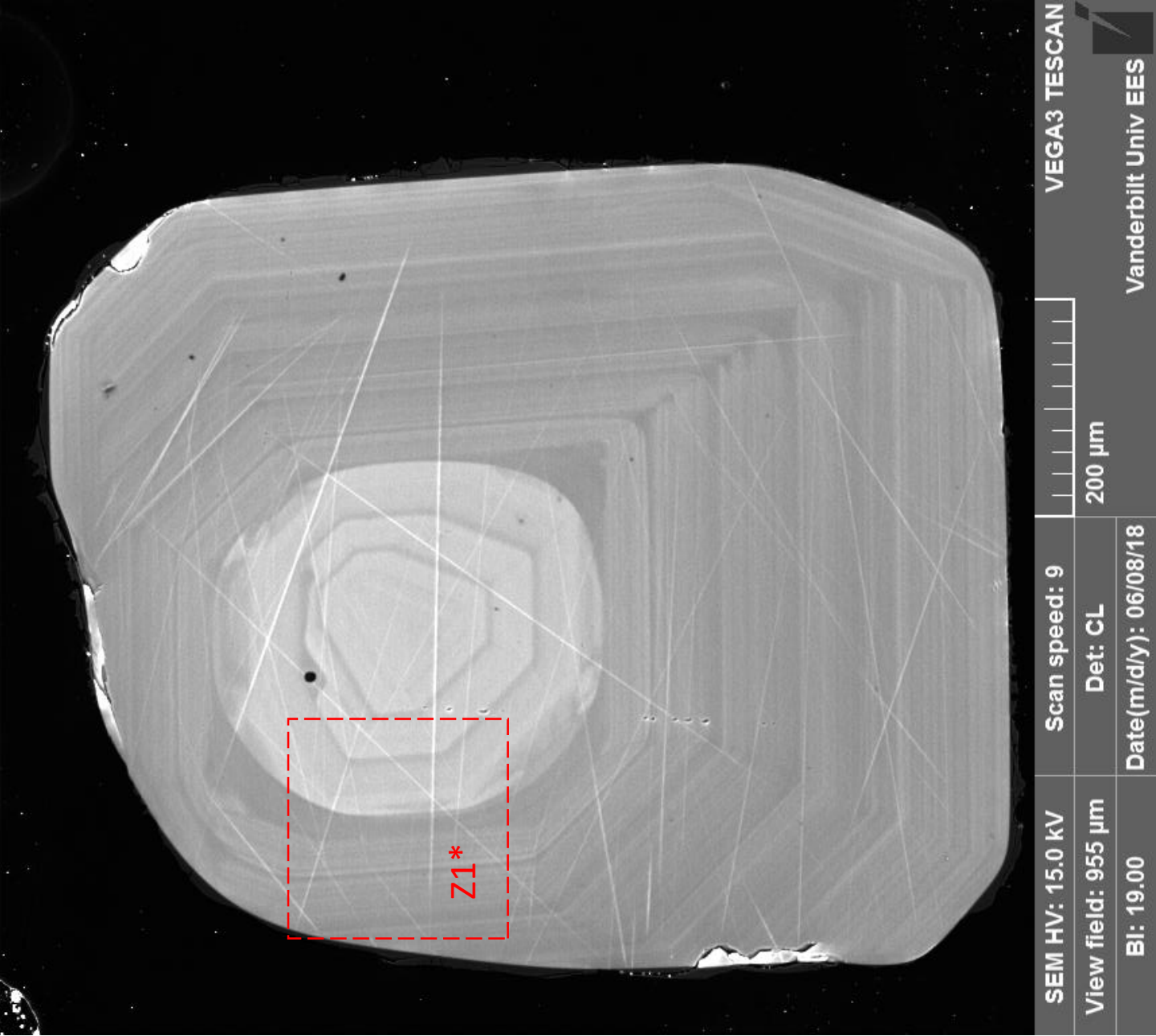
SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.02 mm	Det: CL	
BI: 19.00	Date(m/d/y): 06/08/18	Vanderbilt Univ EES

200 μm

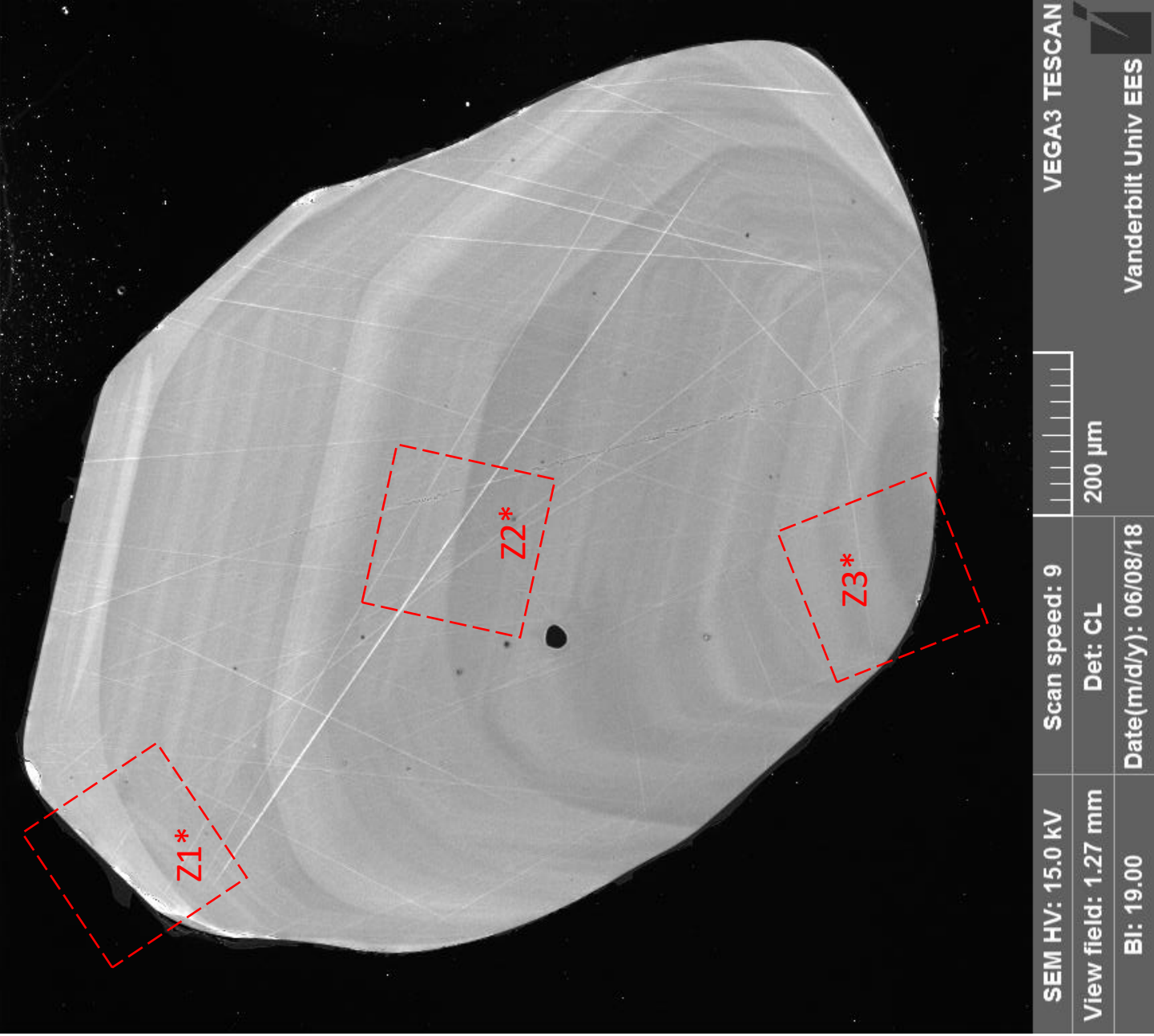
TOKM-1-212-22



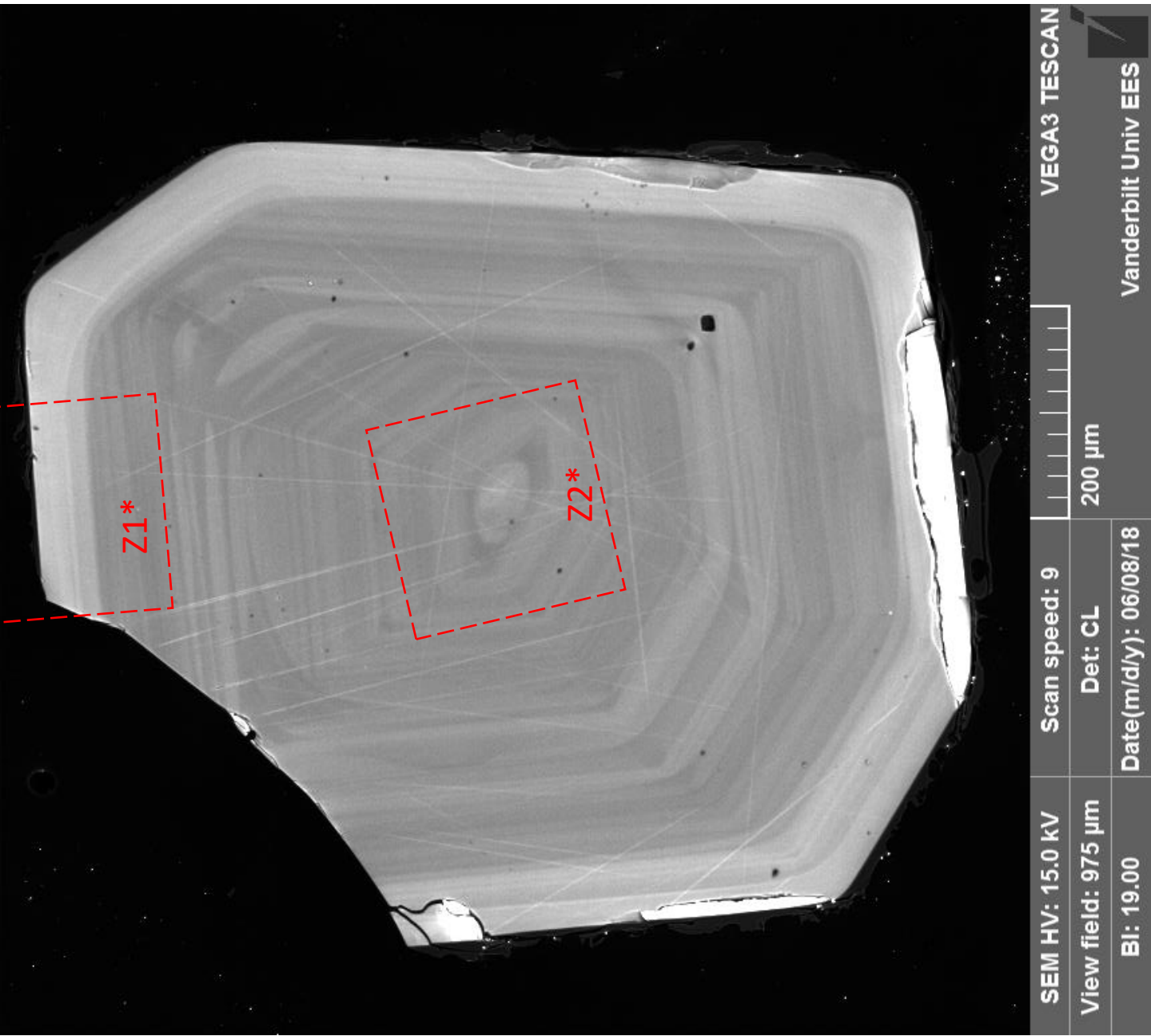
TOKM-1-212-23



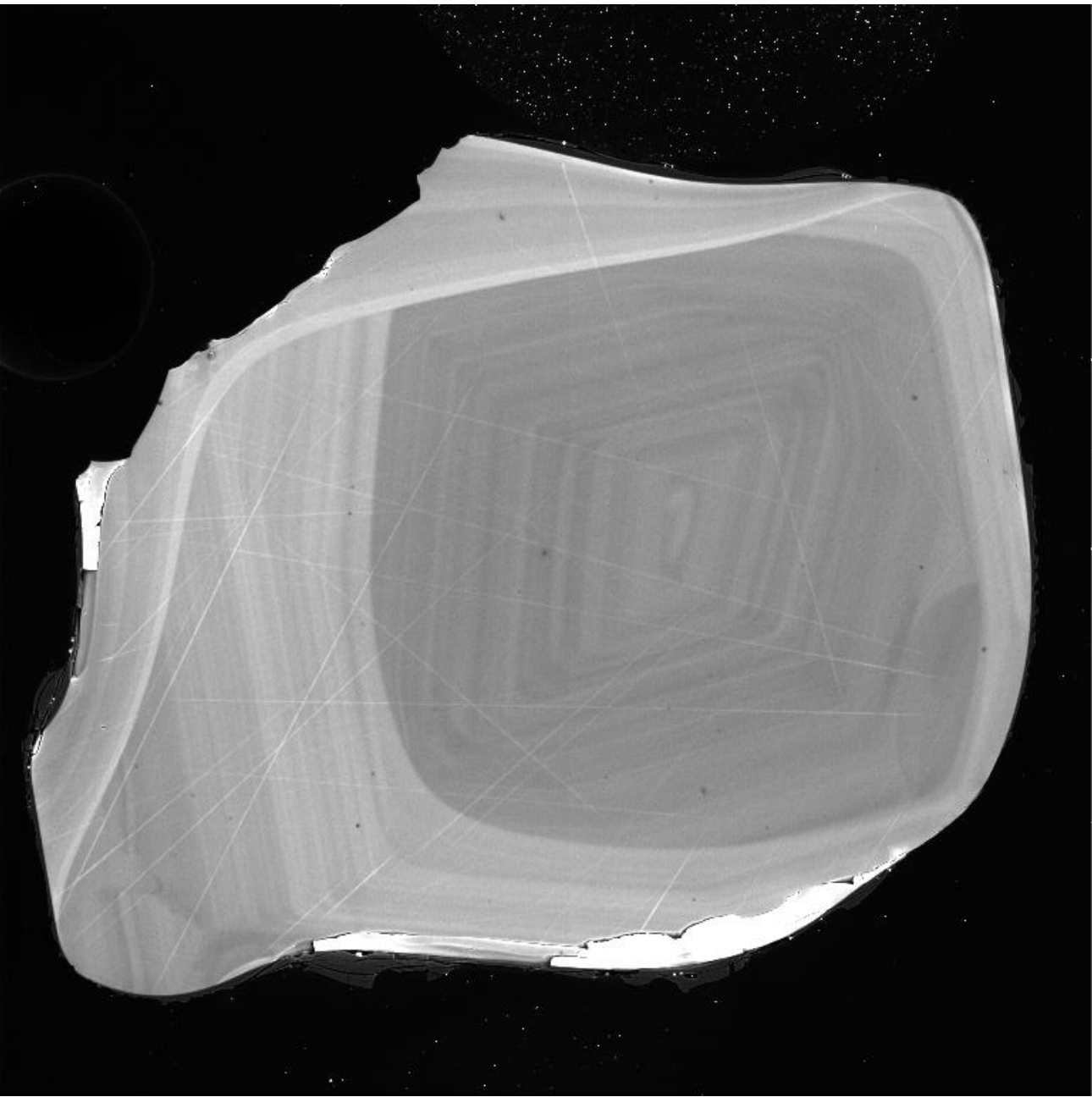
TOKM-1-212-24



TOKM-1-212-25



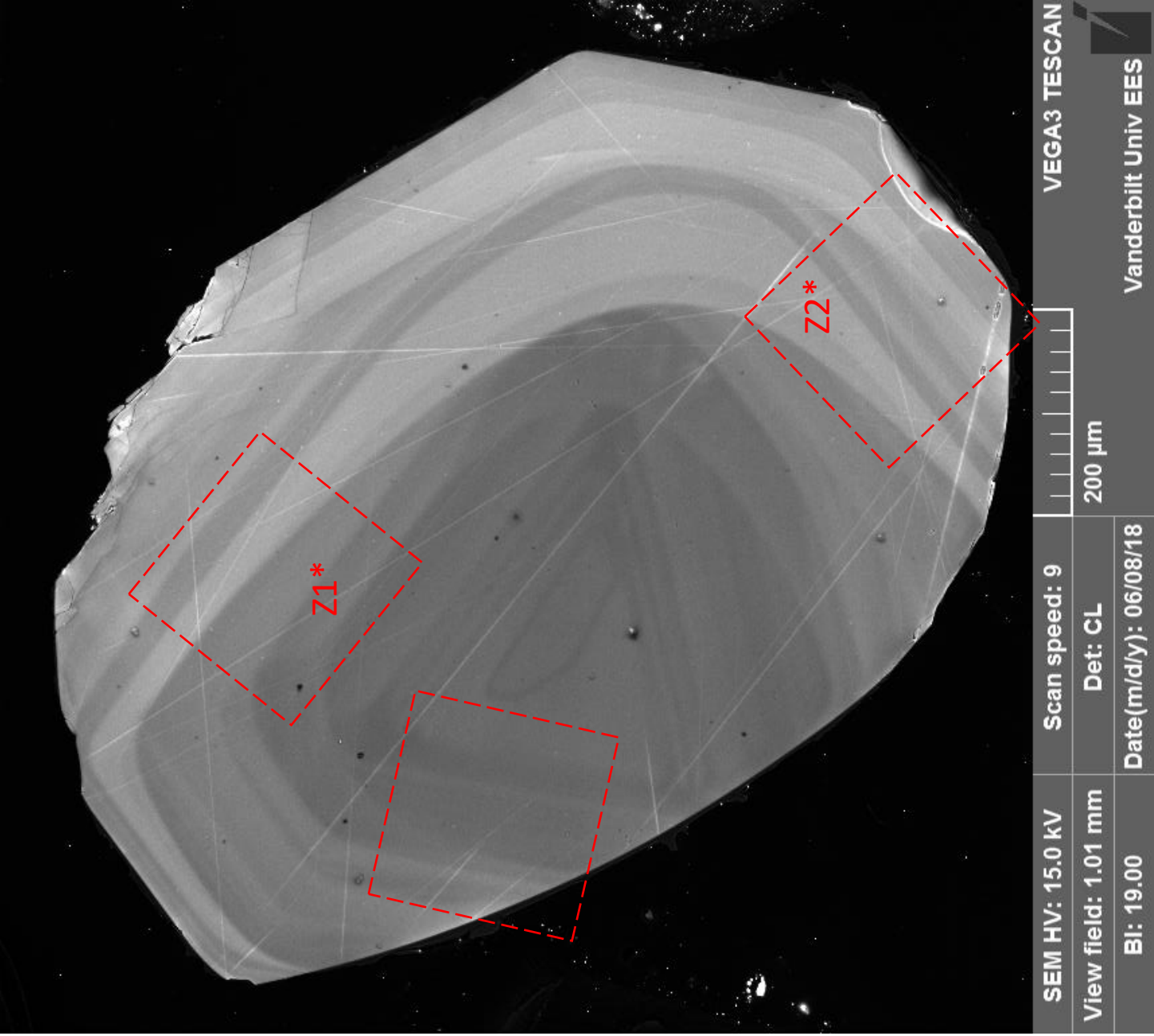
TOKM-1-212-26



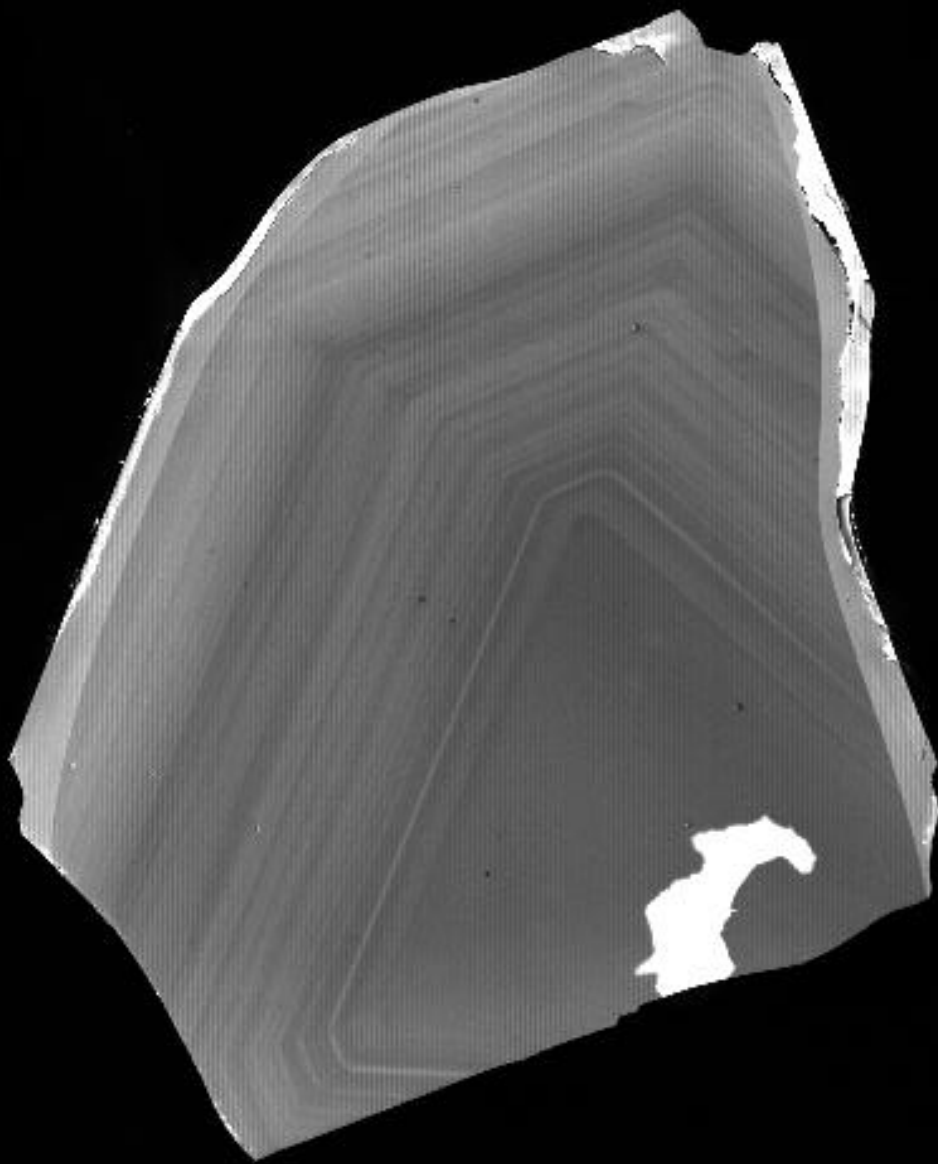
SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.15 mm	Det: CL	
BI: 19.00	Date(m/d/y): 06/08/18	Vanderbilt Univ EES

200 μm

TOKM-1-212-27

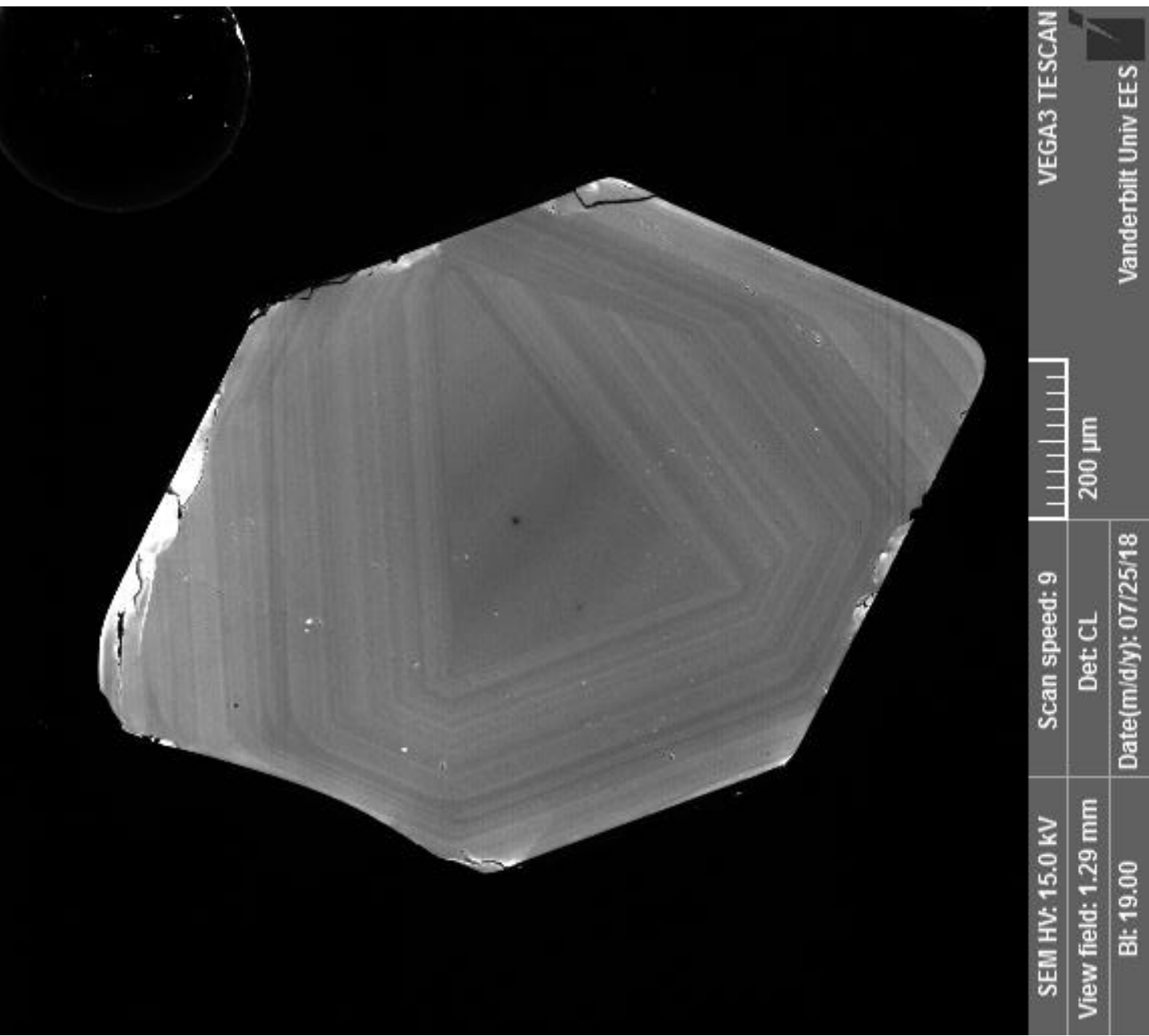


TOKM-1-212-28



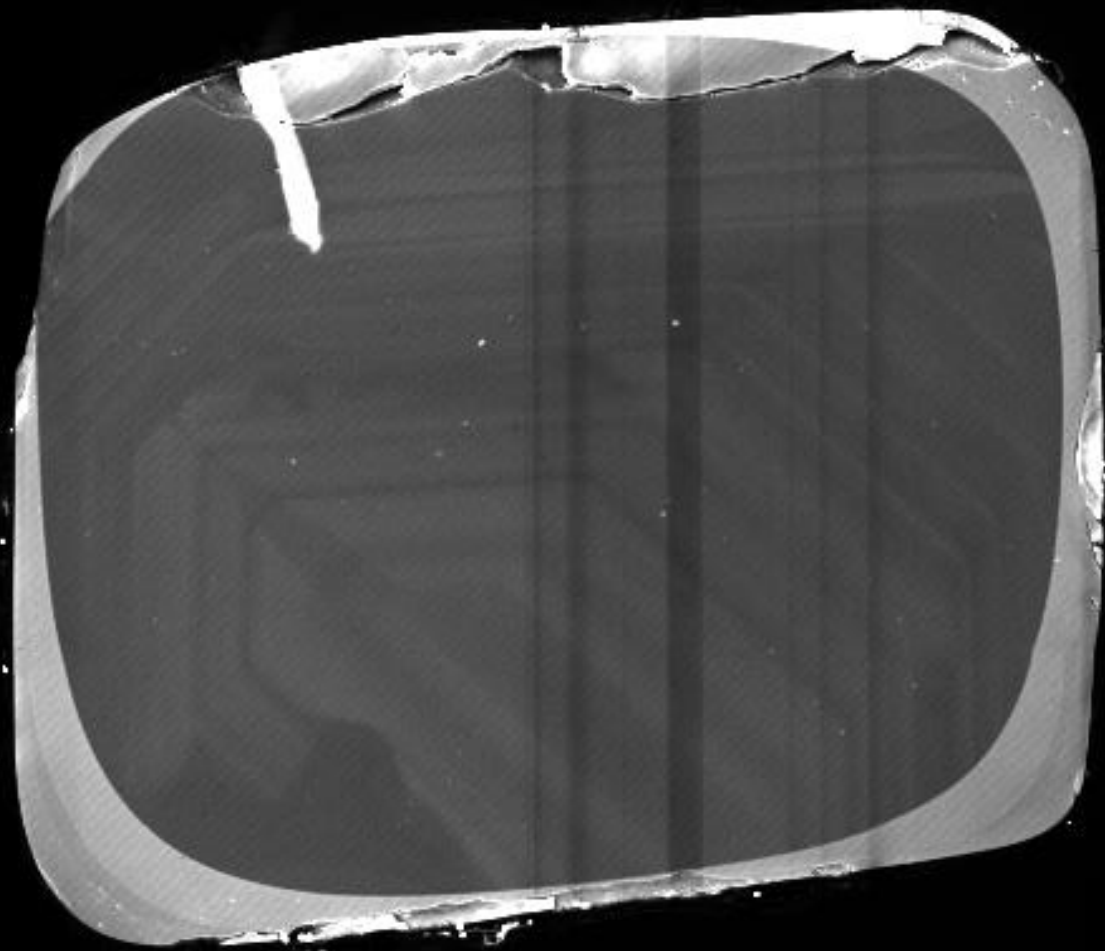
SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.84 mm	Det: CL	500 μm
BI: 19.00	Date(m/d/y): 07/25/18	Vanderbilt Univ EES

TOKM-1-212-30



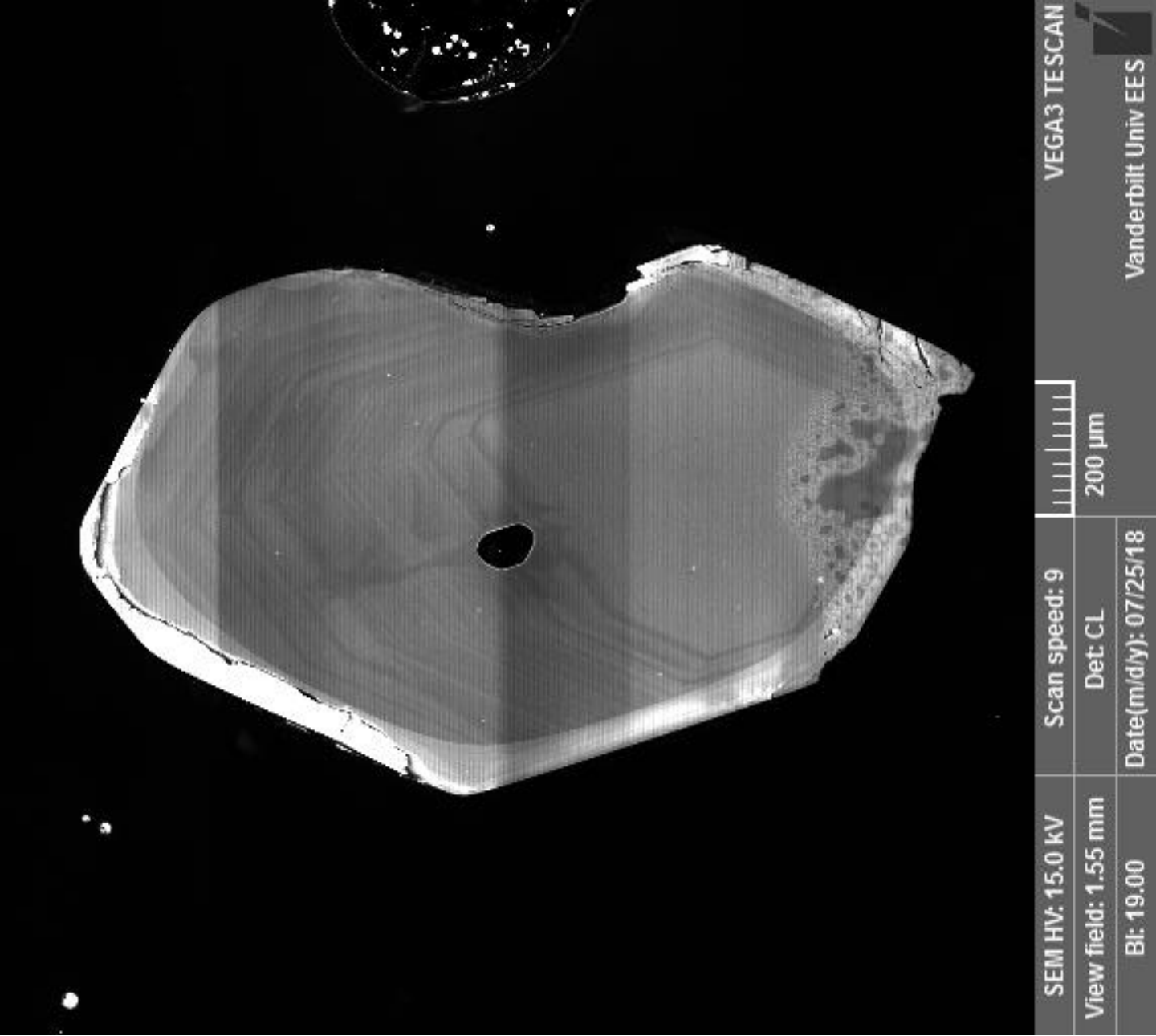
TOKM-1-212-31

付録2. 石英粒子のCL像



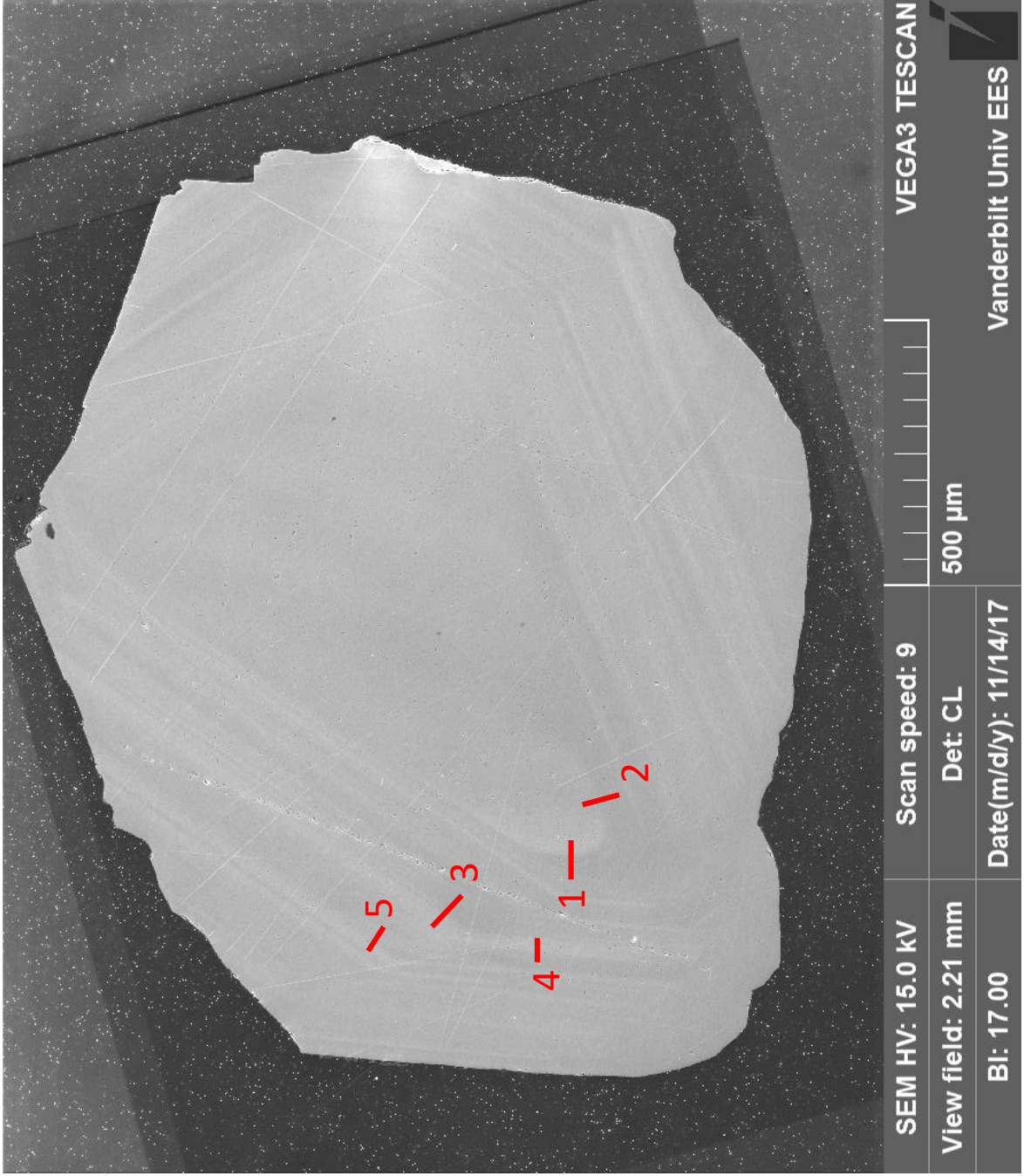
SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 967 μm	Det: CL	200 μm
BI: 19.00	Date(m/d/y): 07/25/18	Vanderbilt Univ EES

TOKM-1-212-32

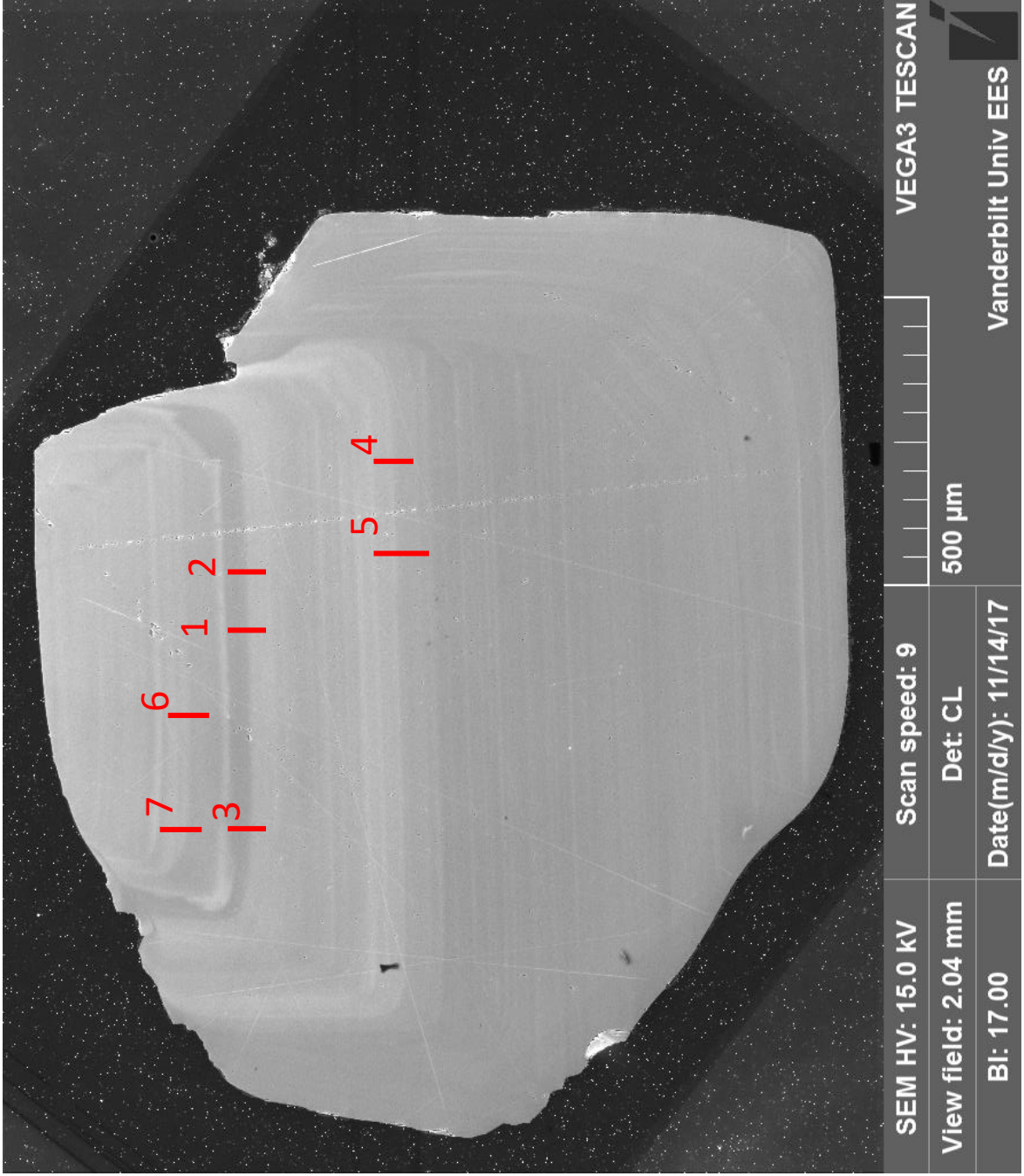


TOKM-1-201

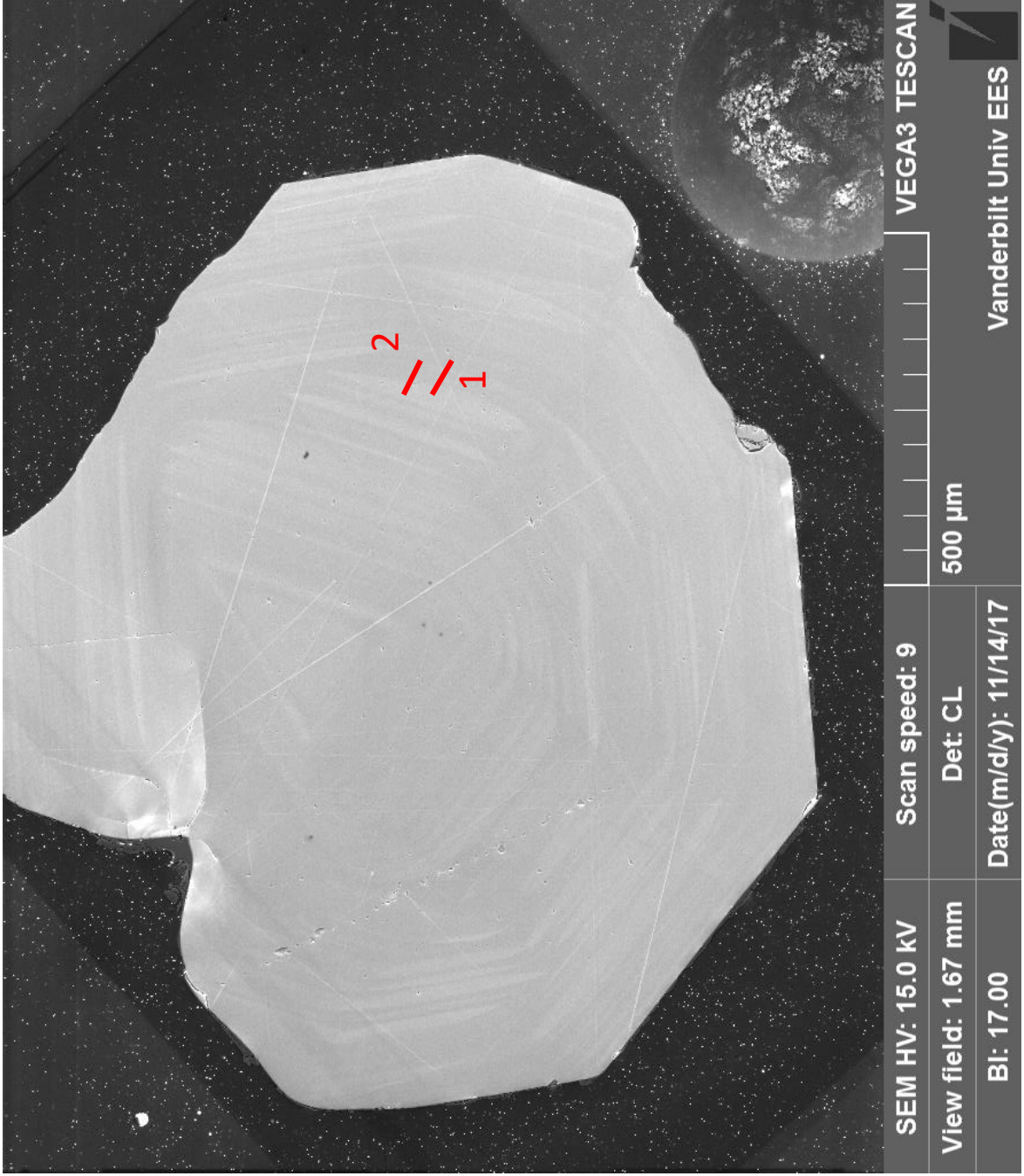
TOKM-1-201-1



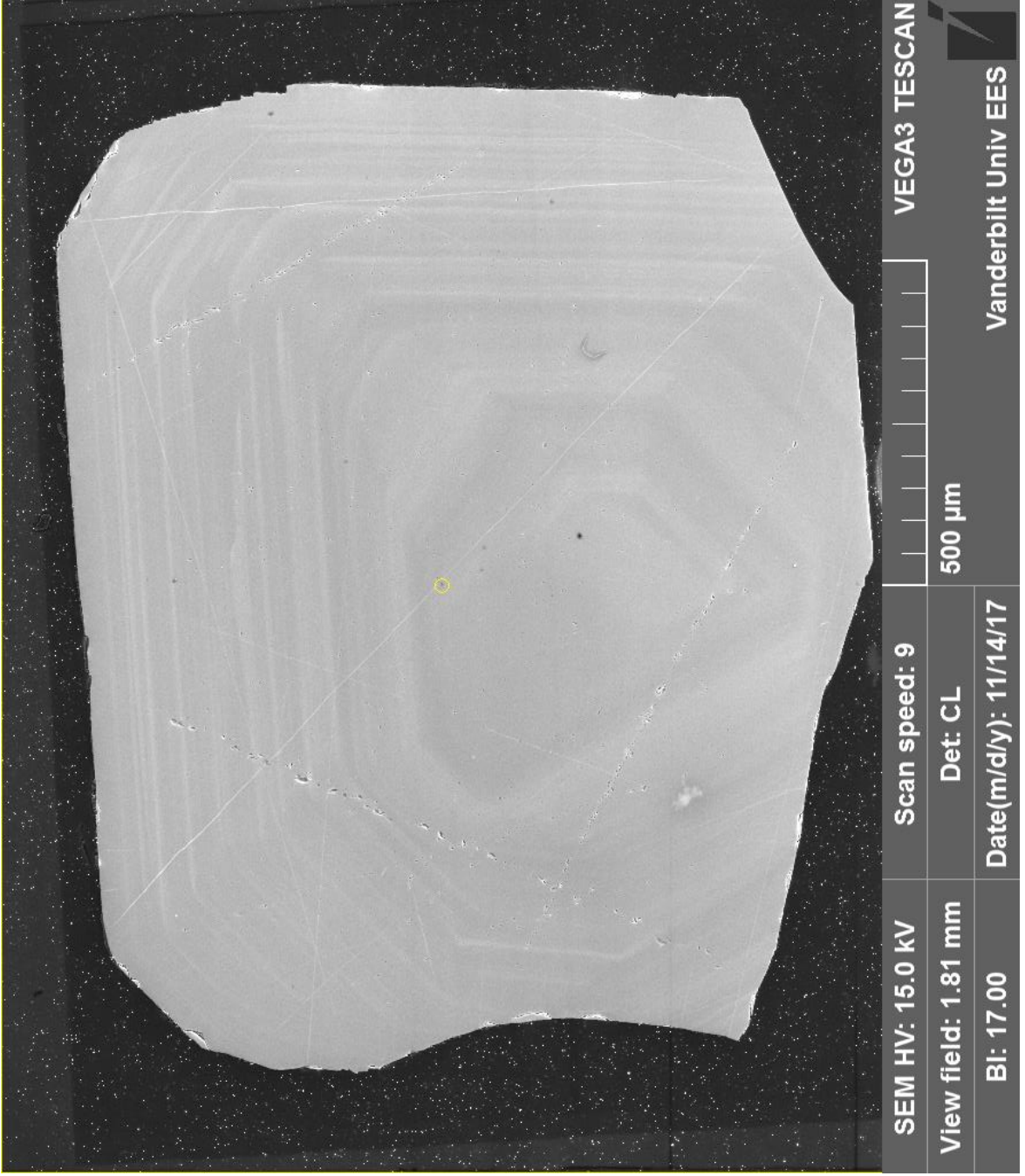
TOKM-1-201-2



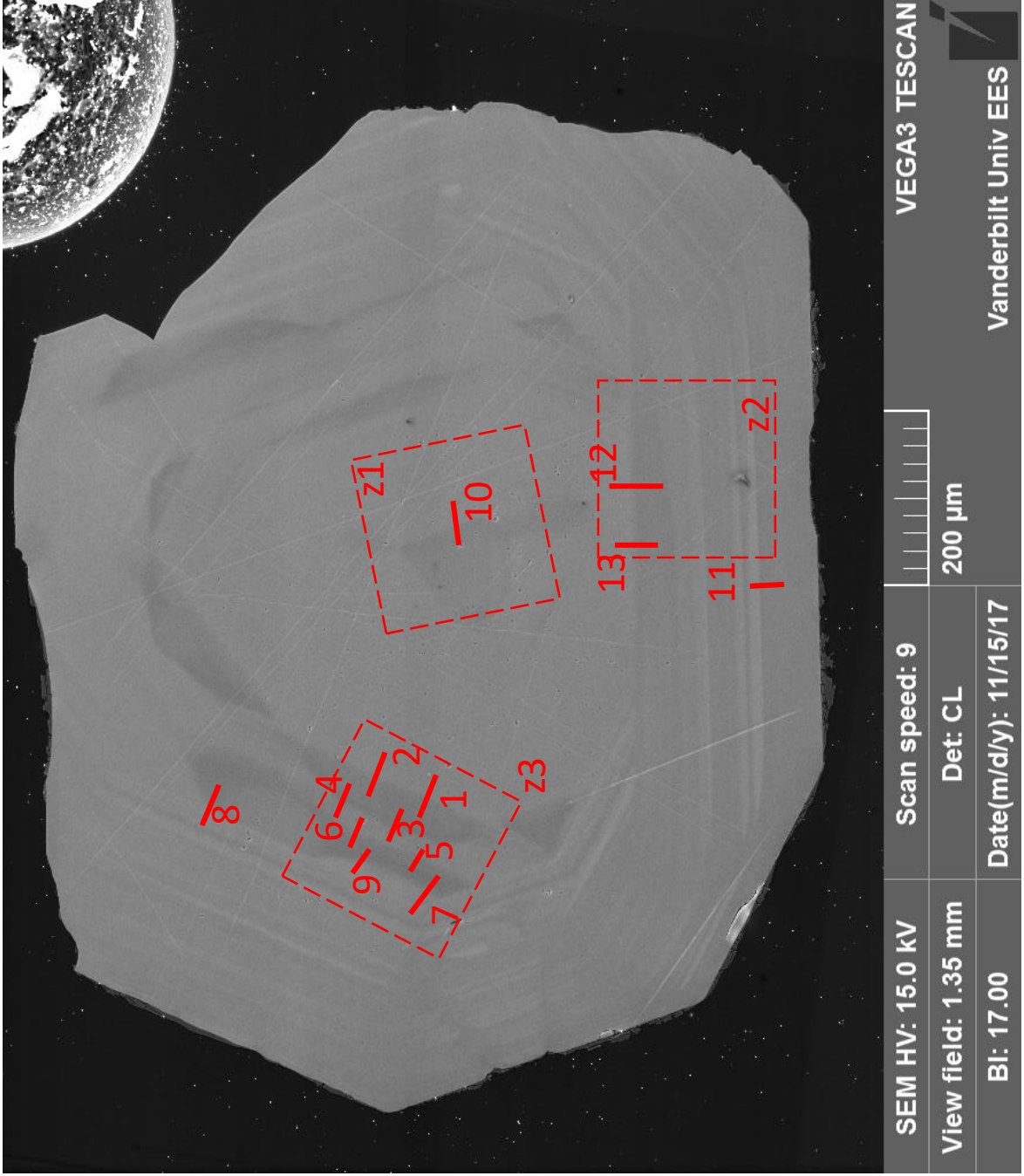
TOKM-1-201-3



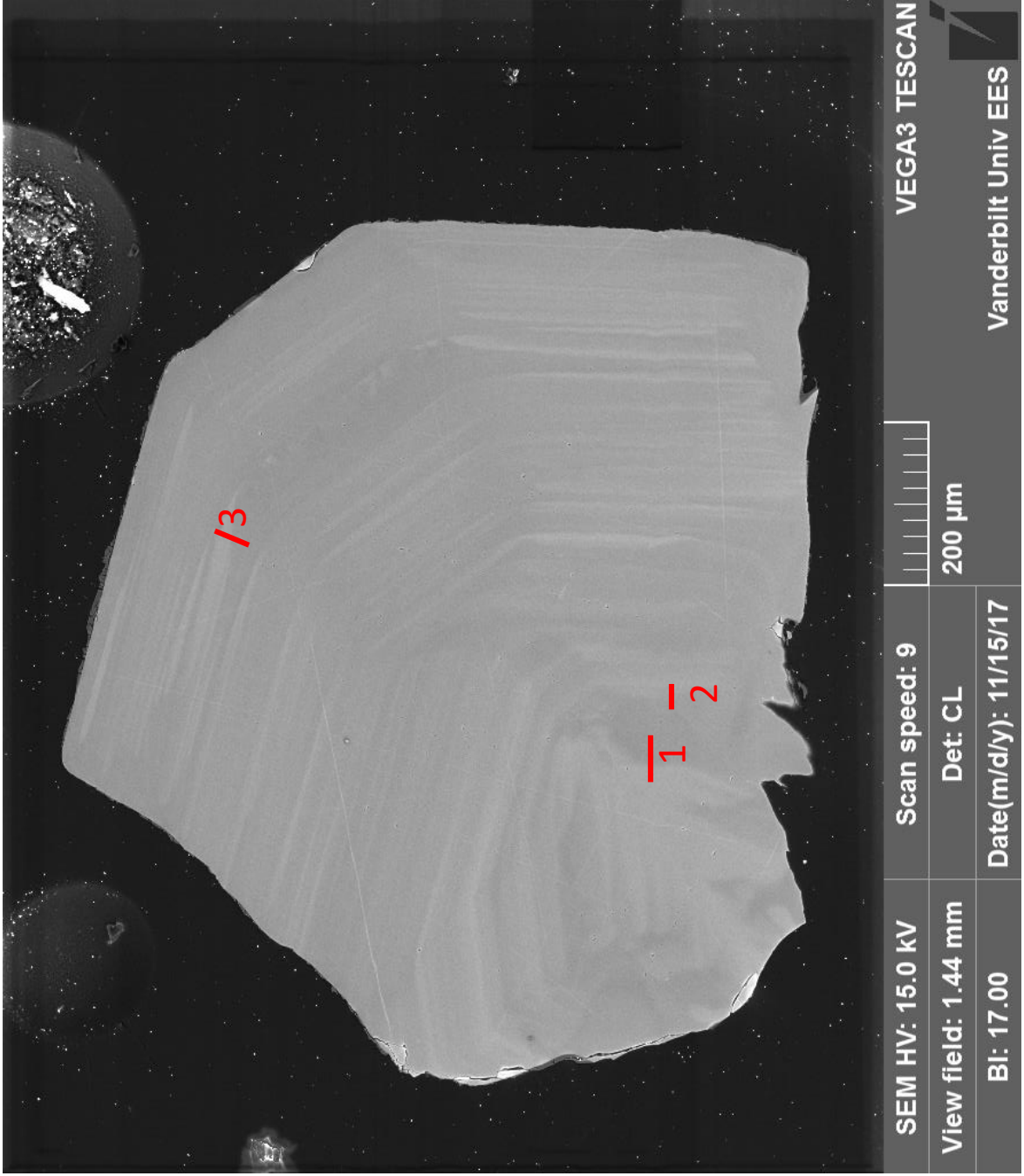
TOKM-1-201-4



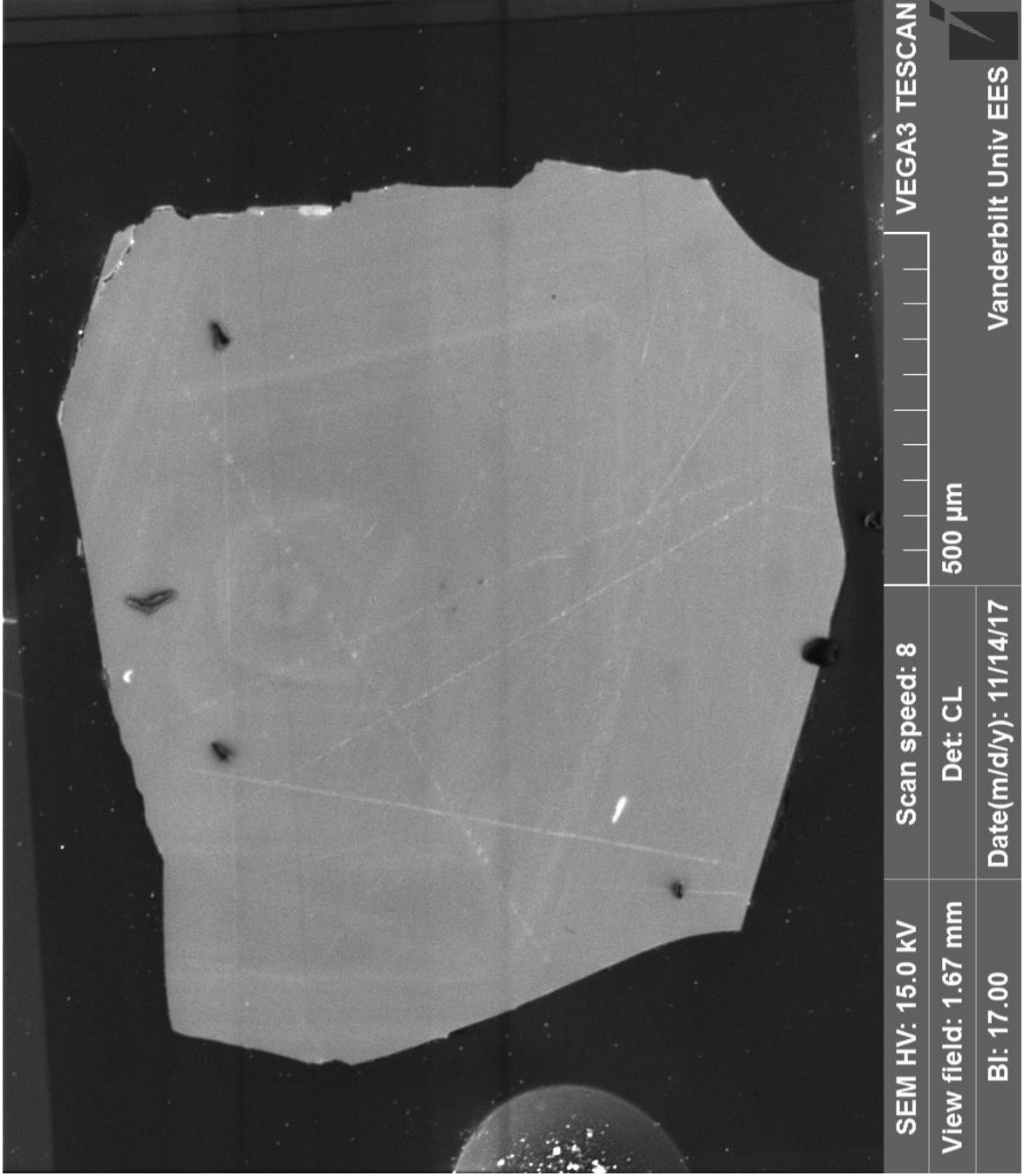
TOKM-1-201-5

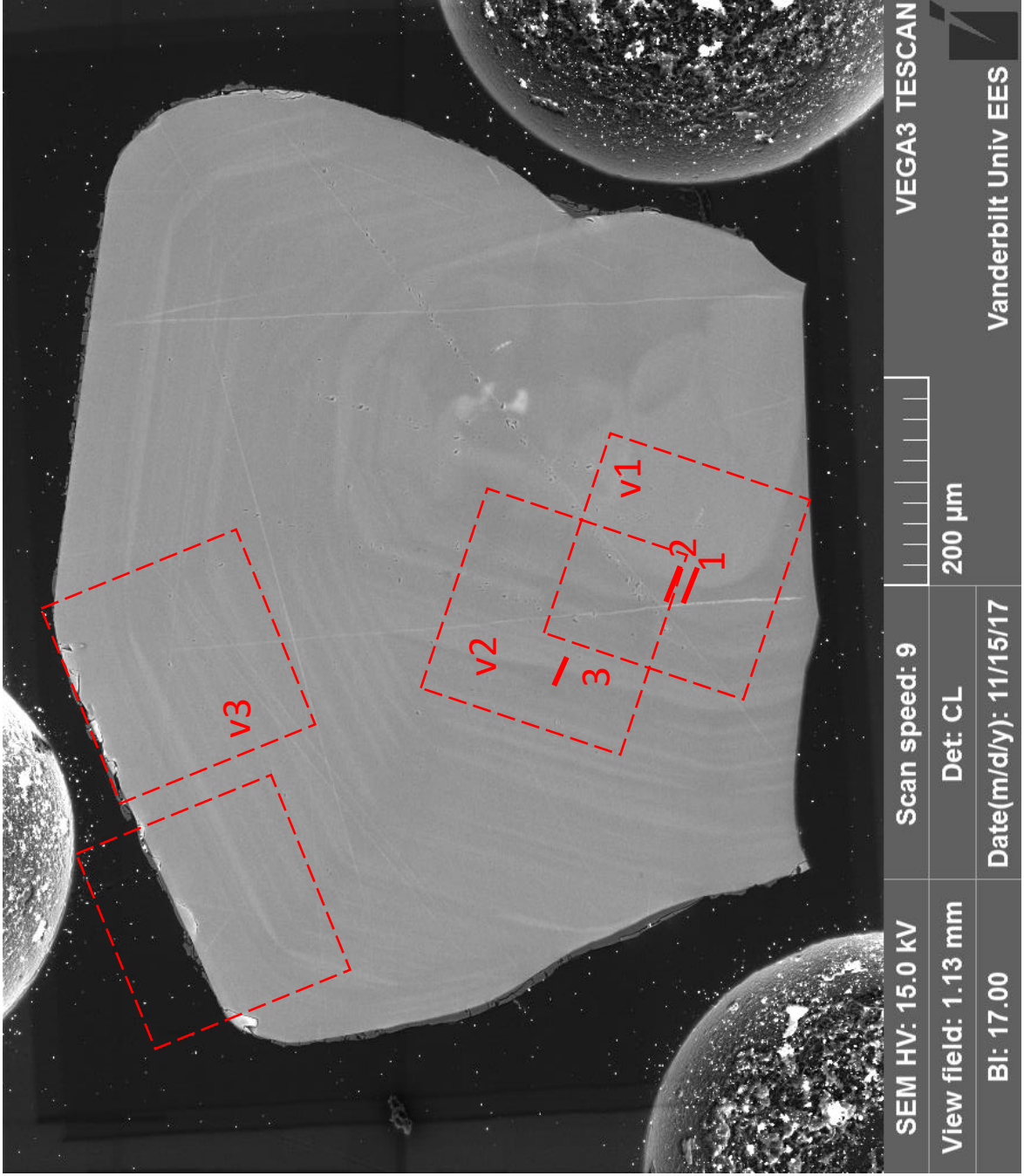


TOKM-1-201-6

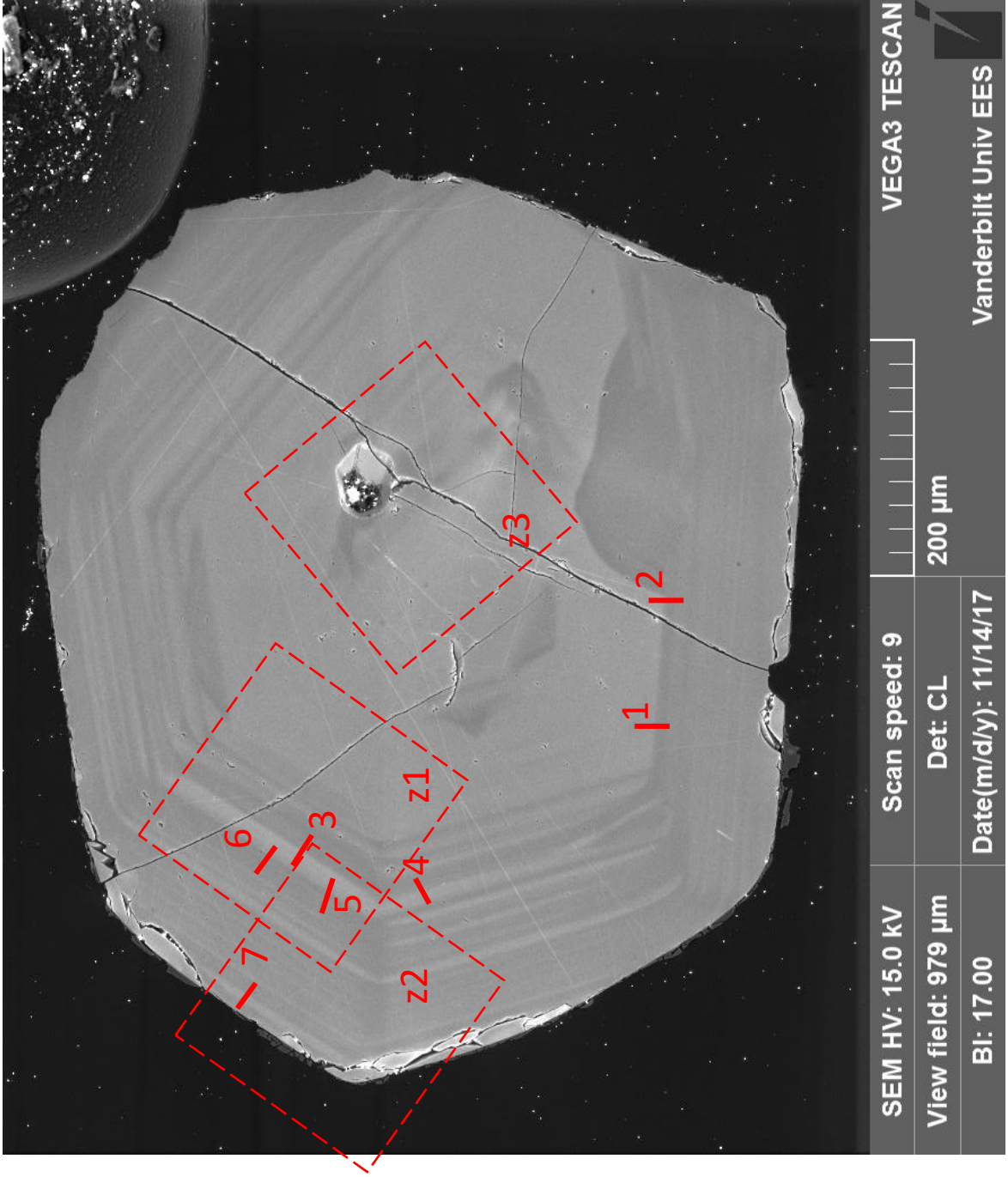


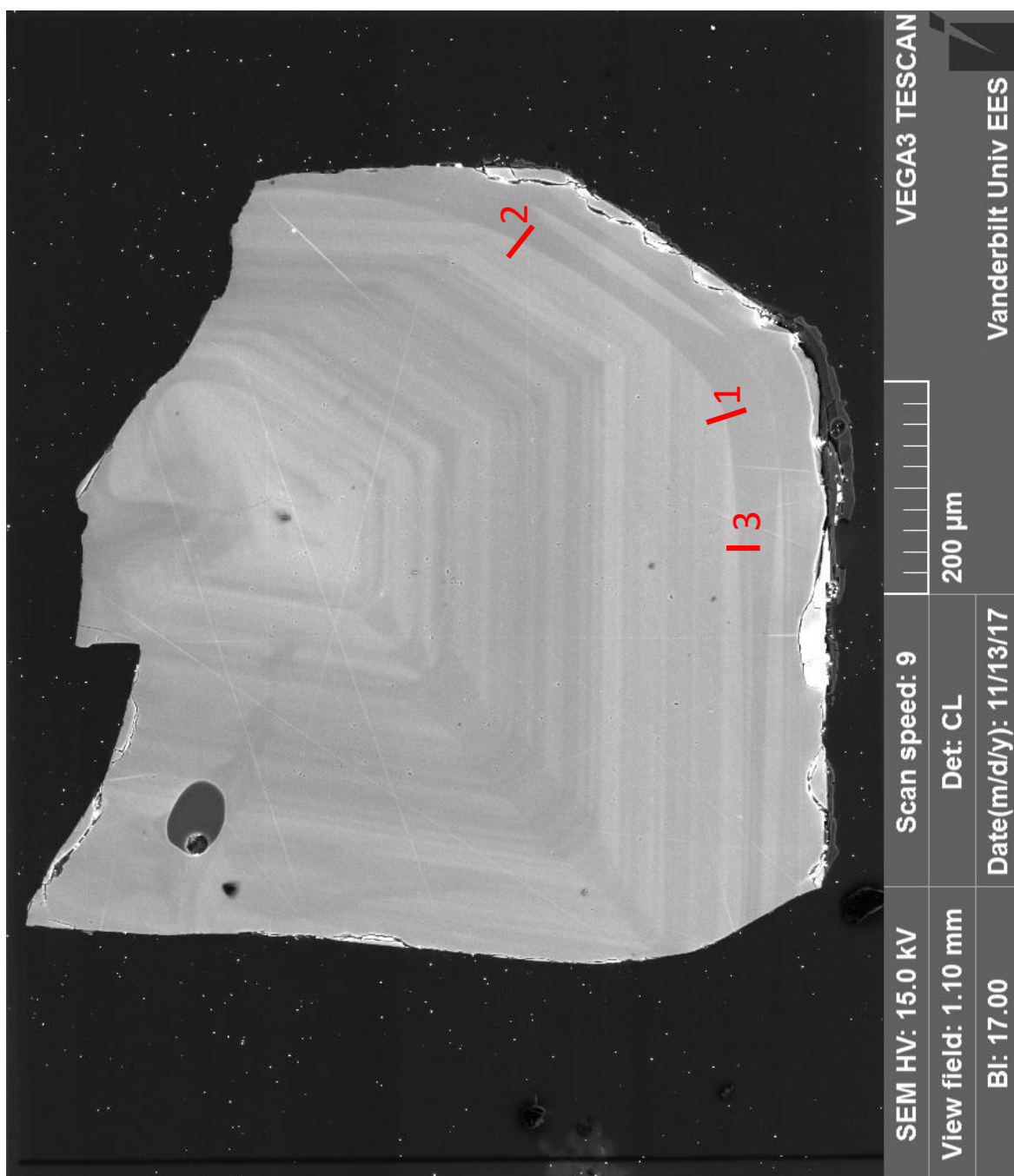
TOKM-1-201-9



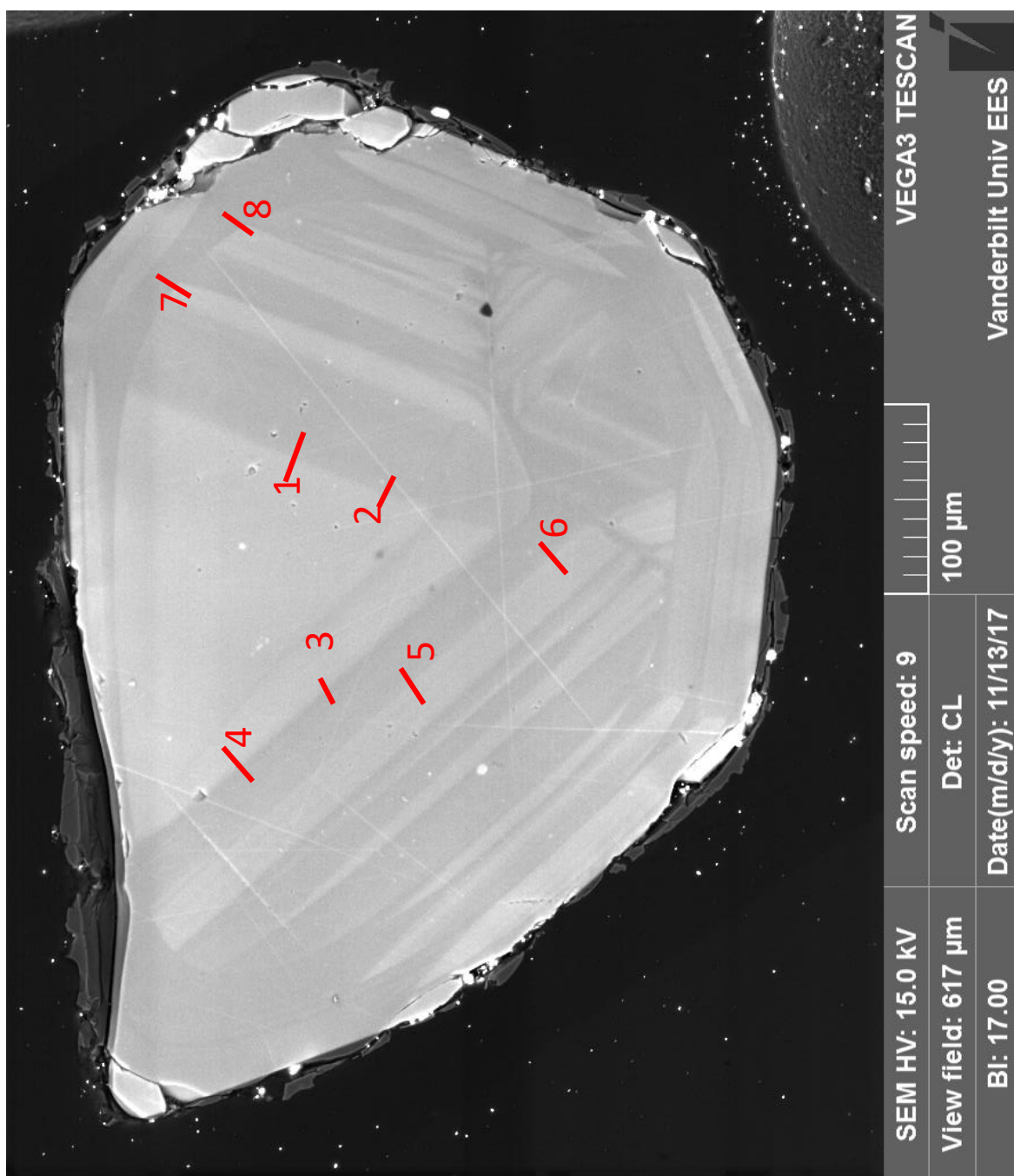


TOKM-1-201-12

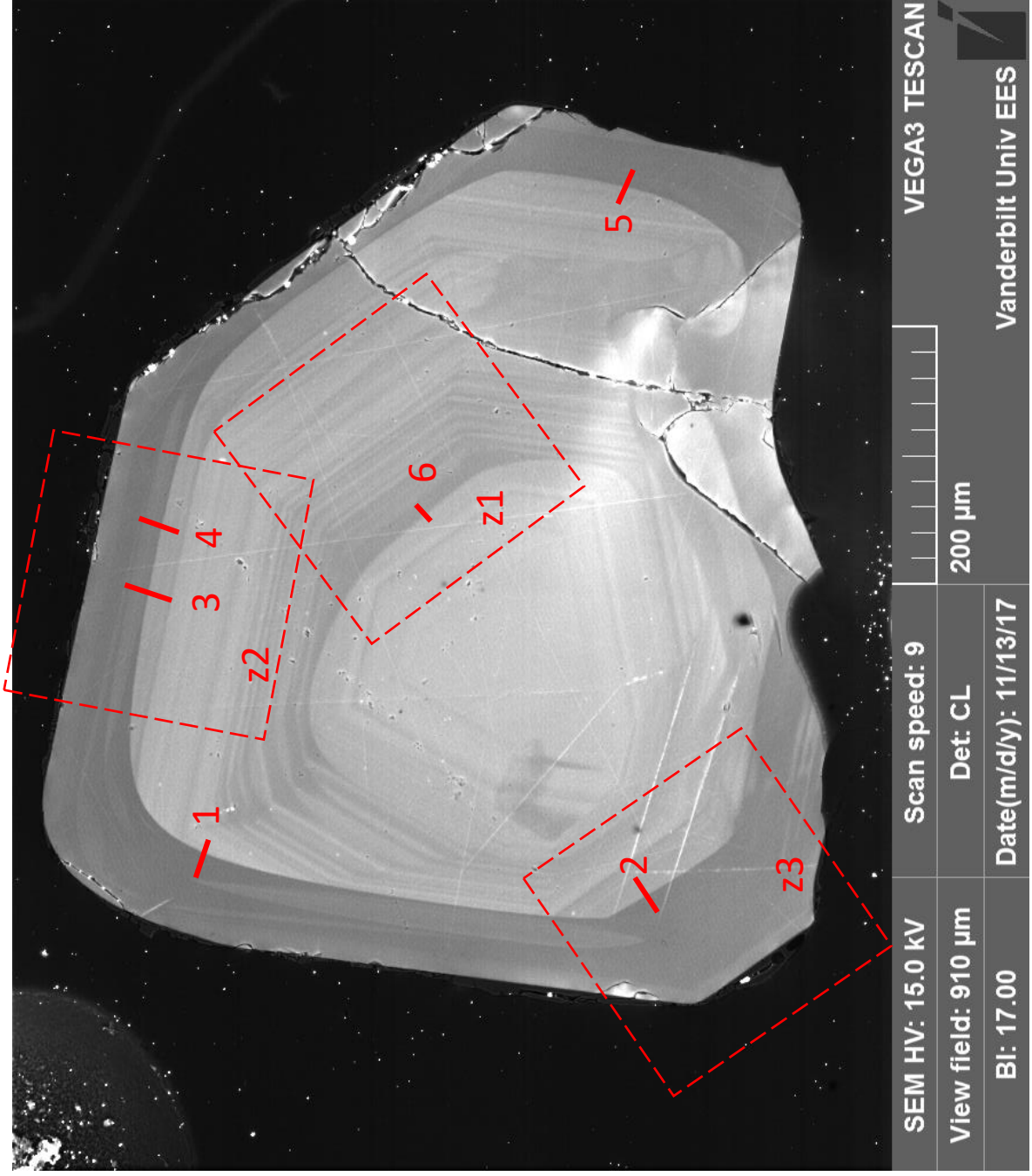


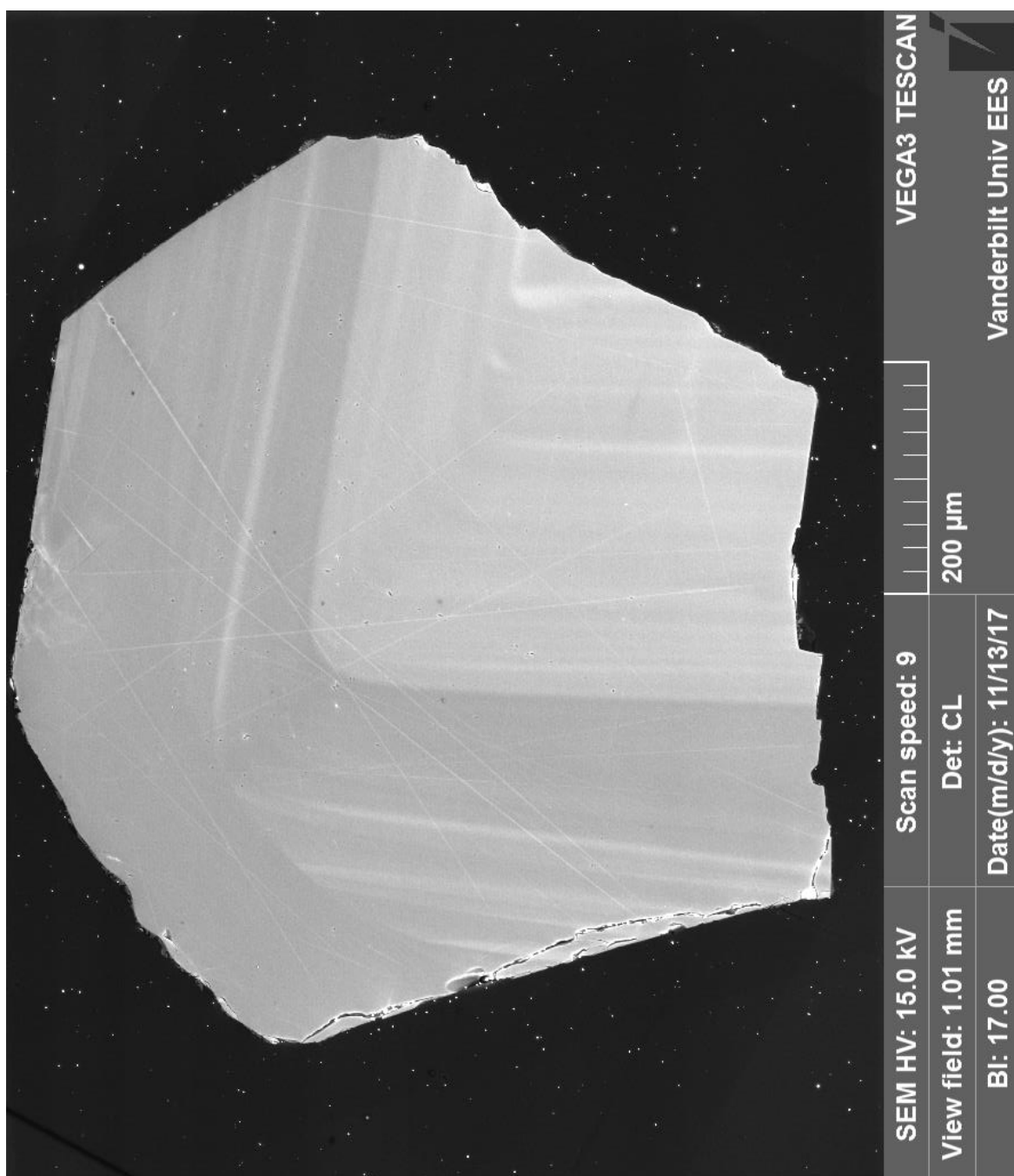


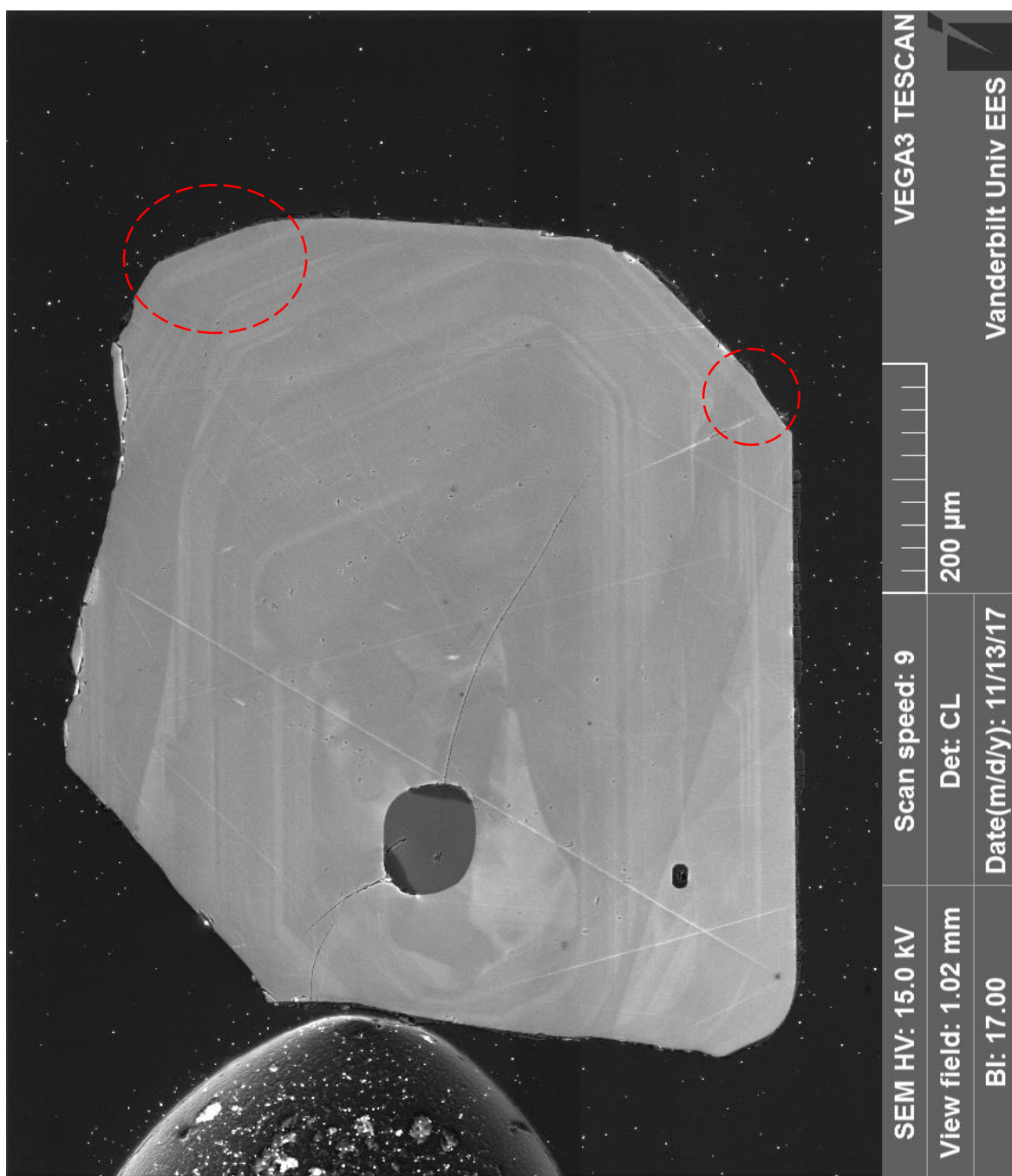
TOKM-1-201-14

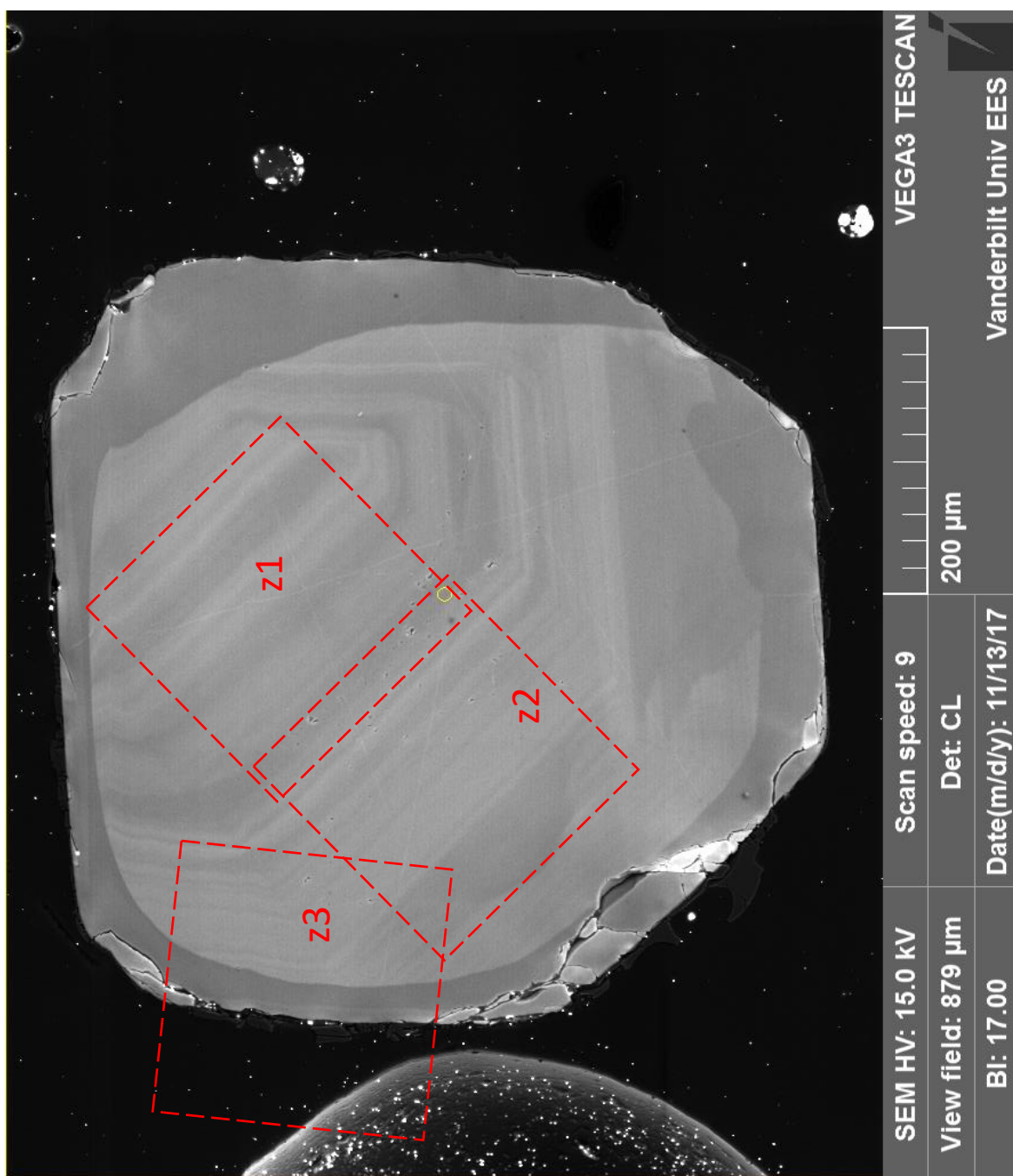


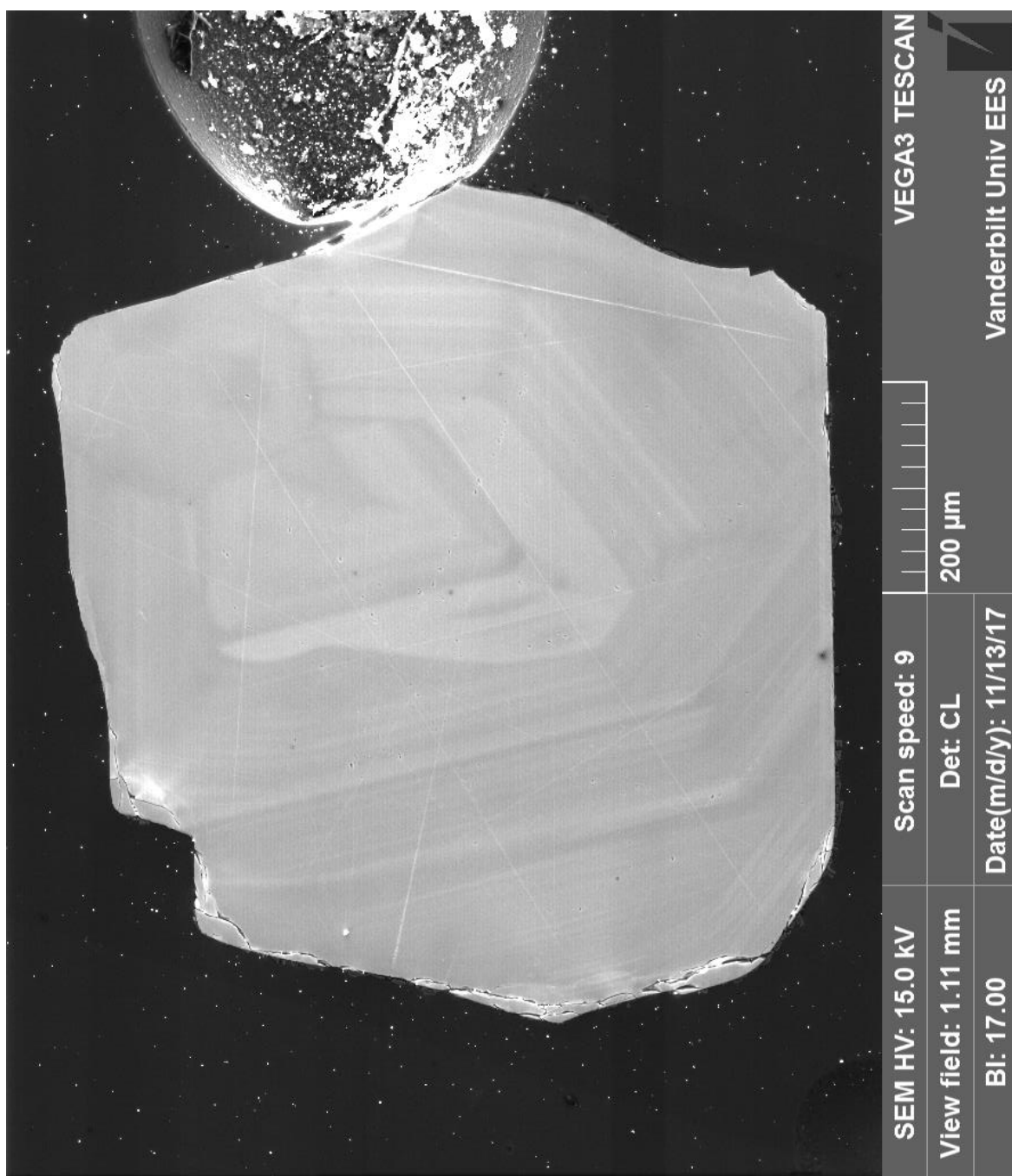
TOKM-1-201-15



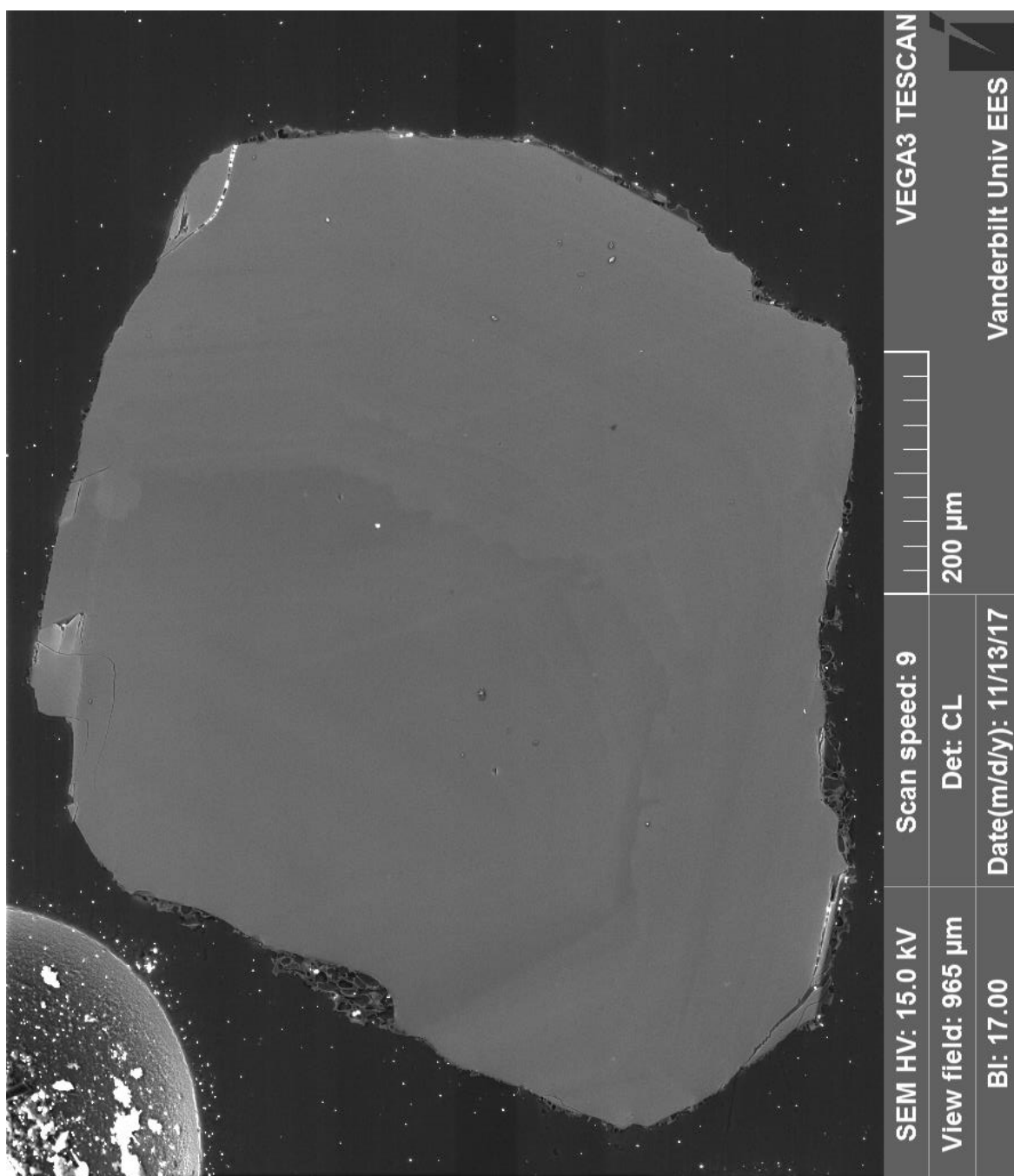


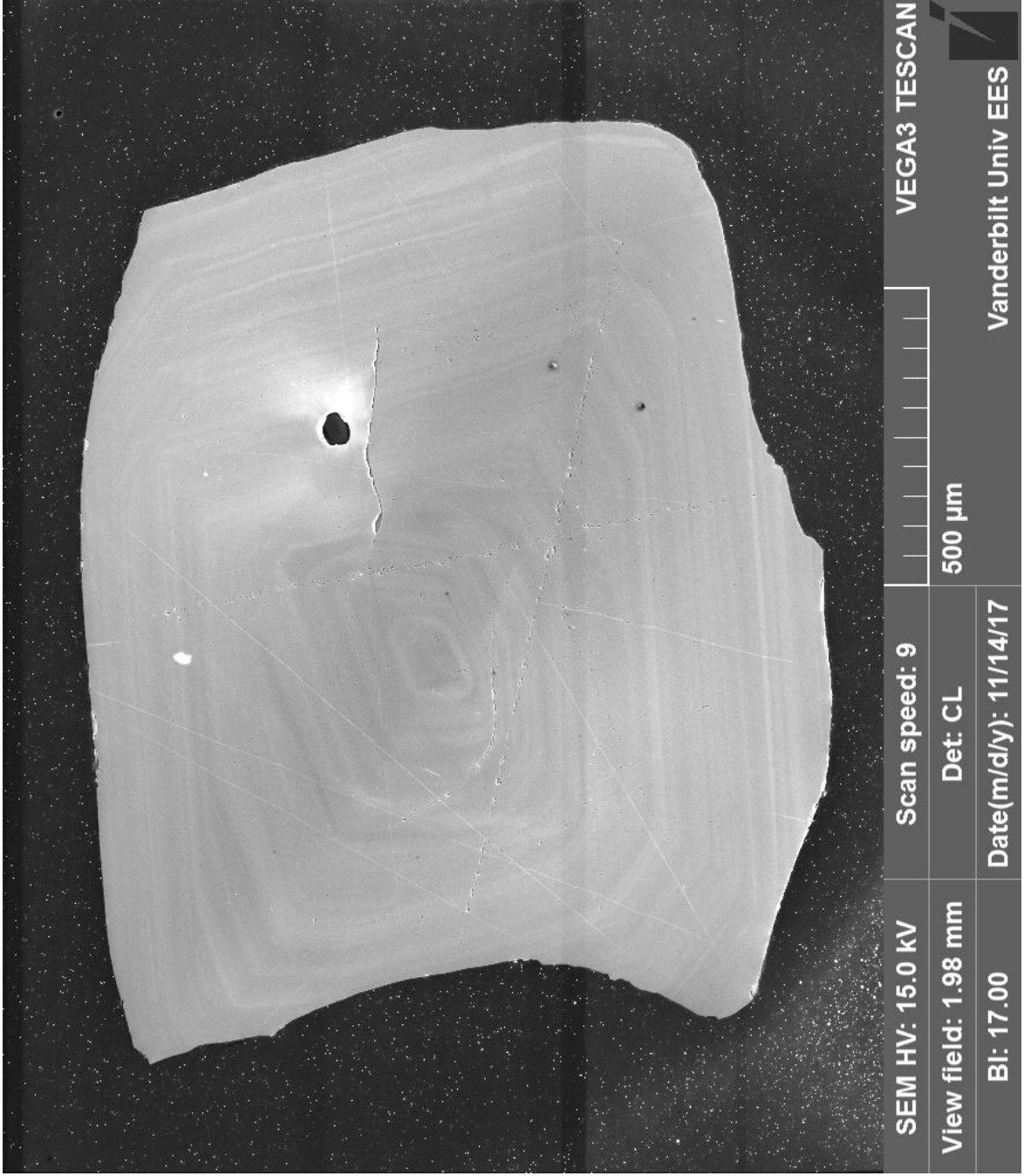






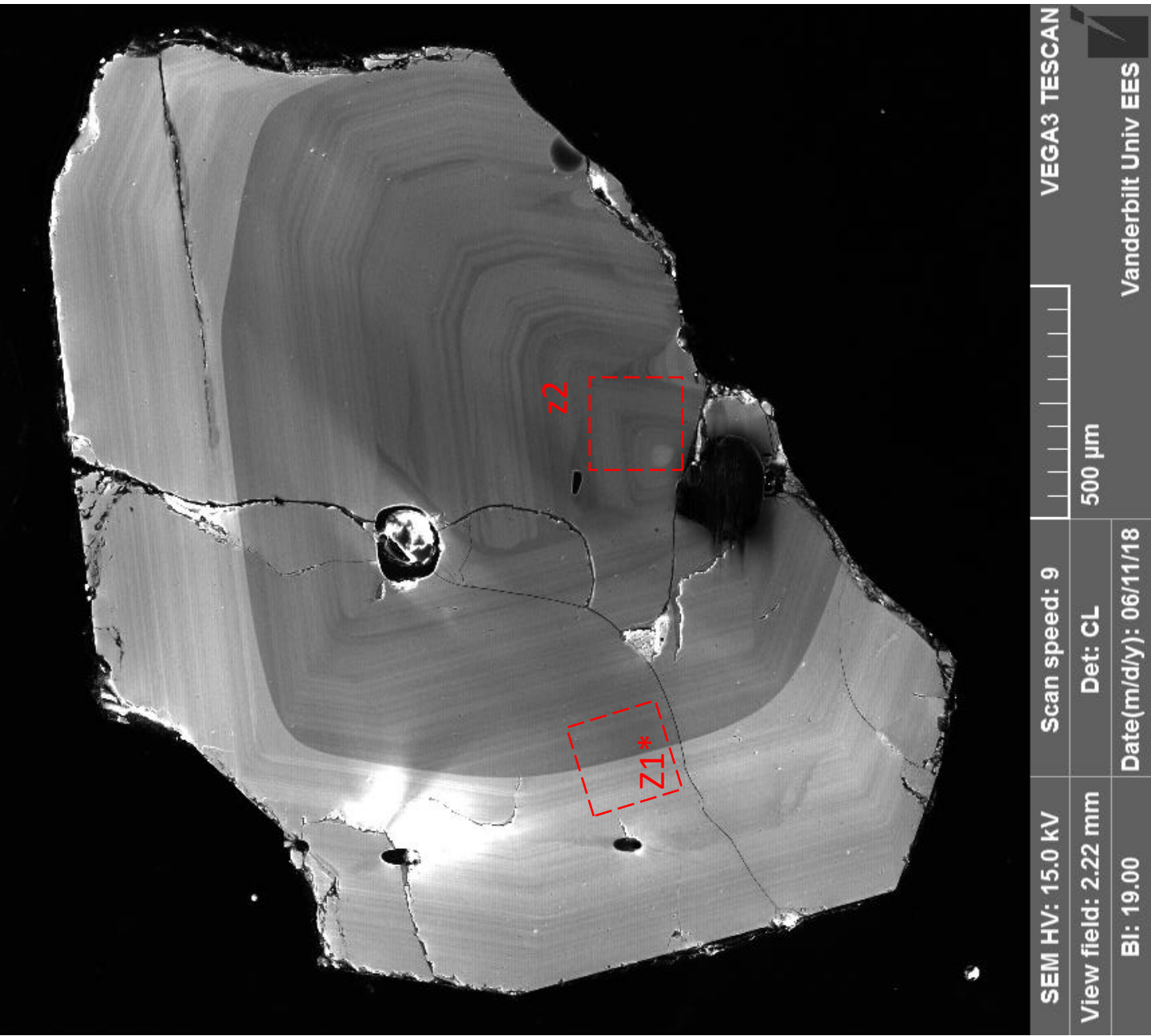
TOKM-1-201-20



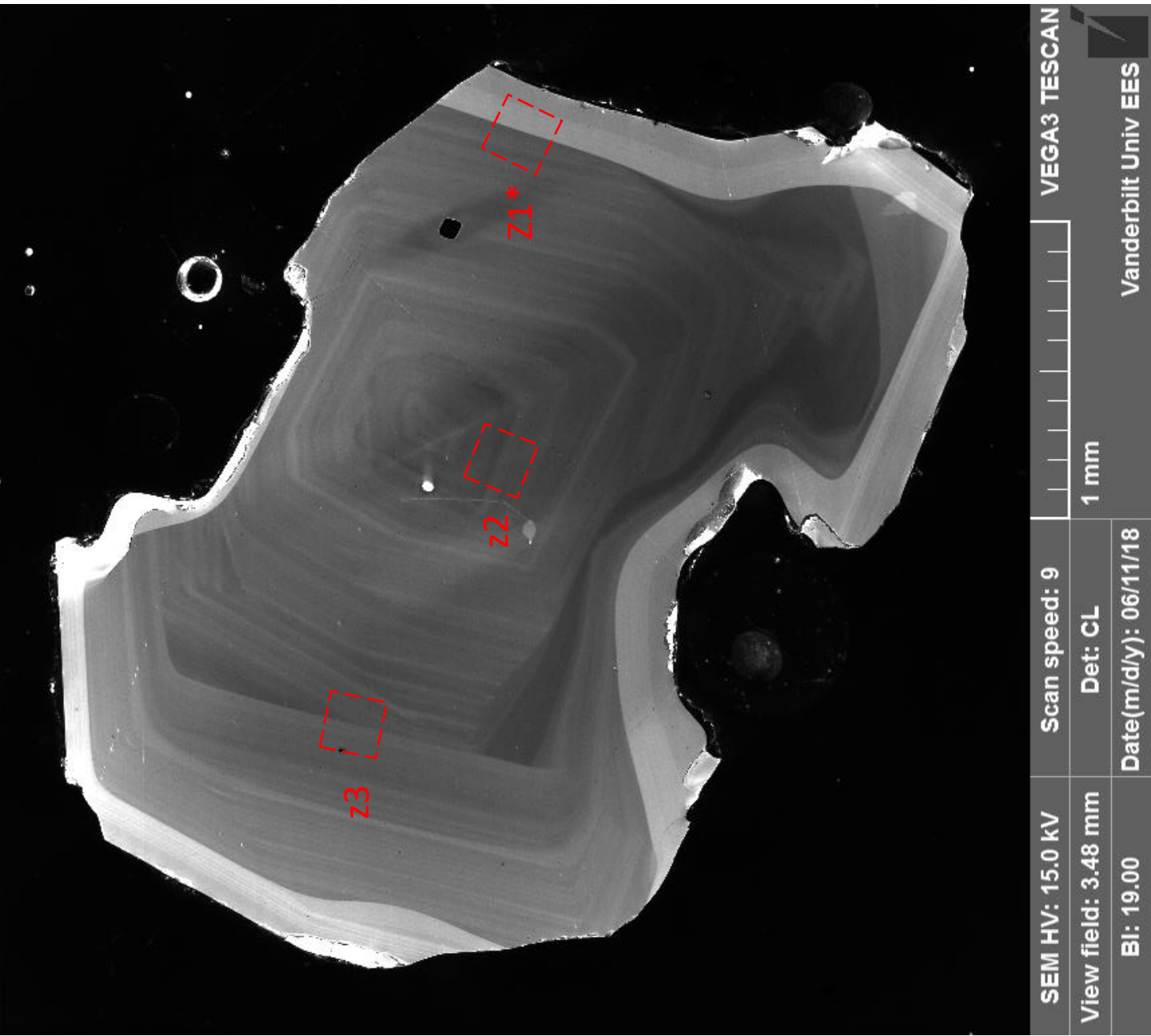


TOKA-3-302

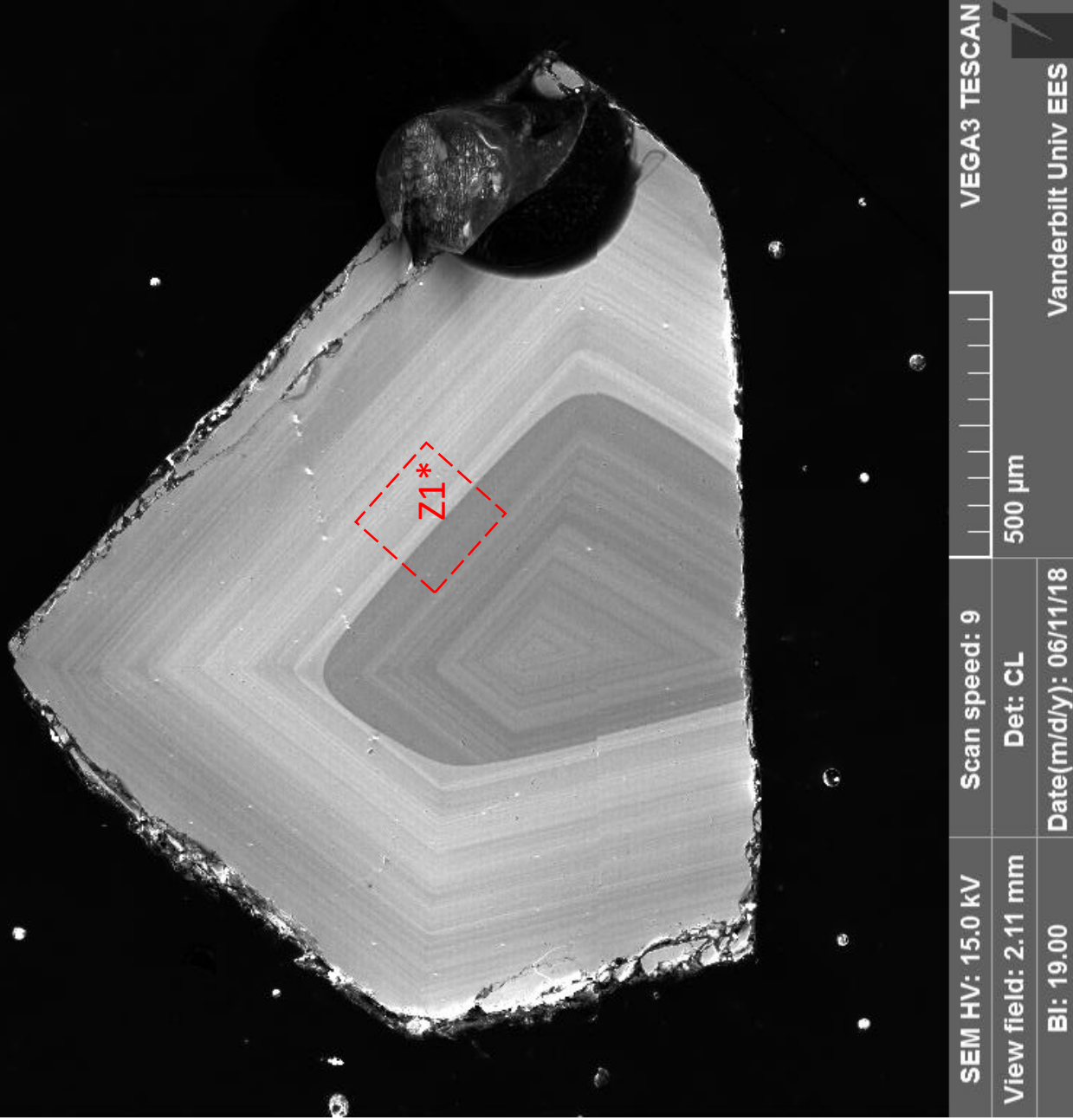
TOKA-3-302-1



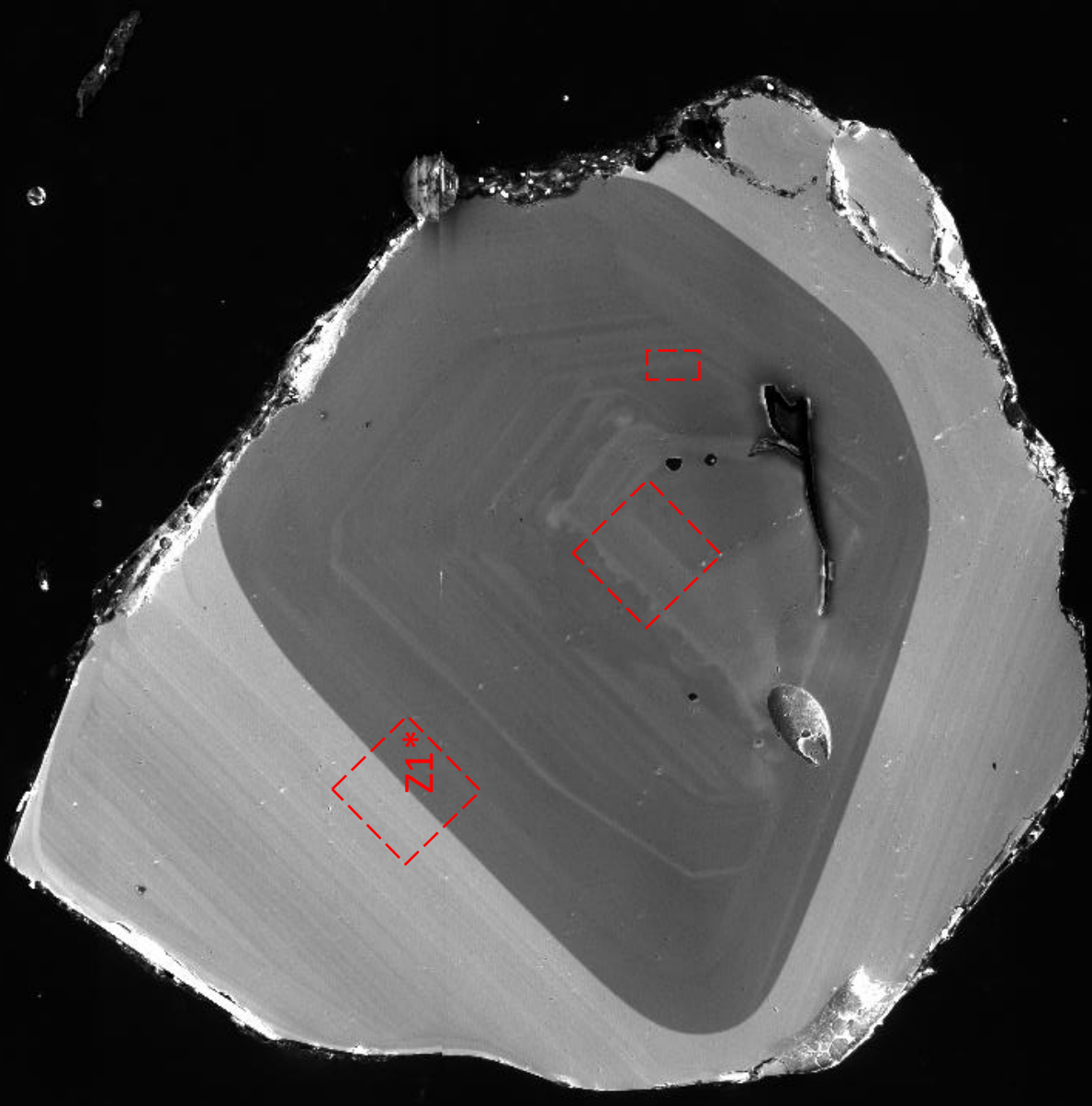
TOKA-3-302-2



TOKA-3-302-3

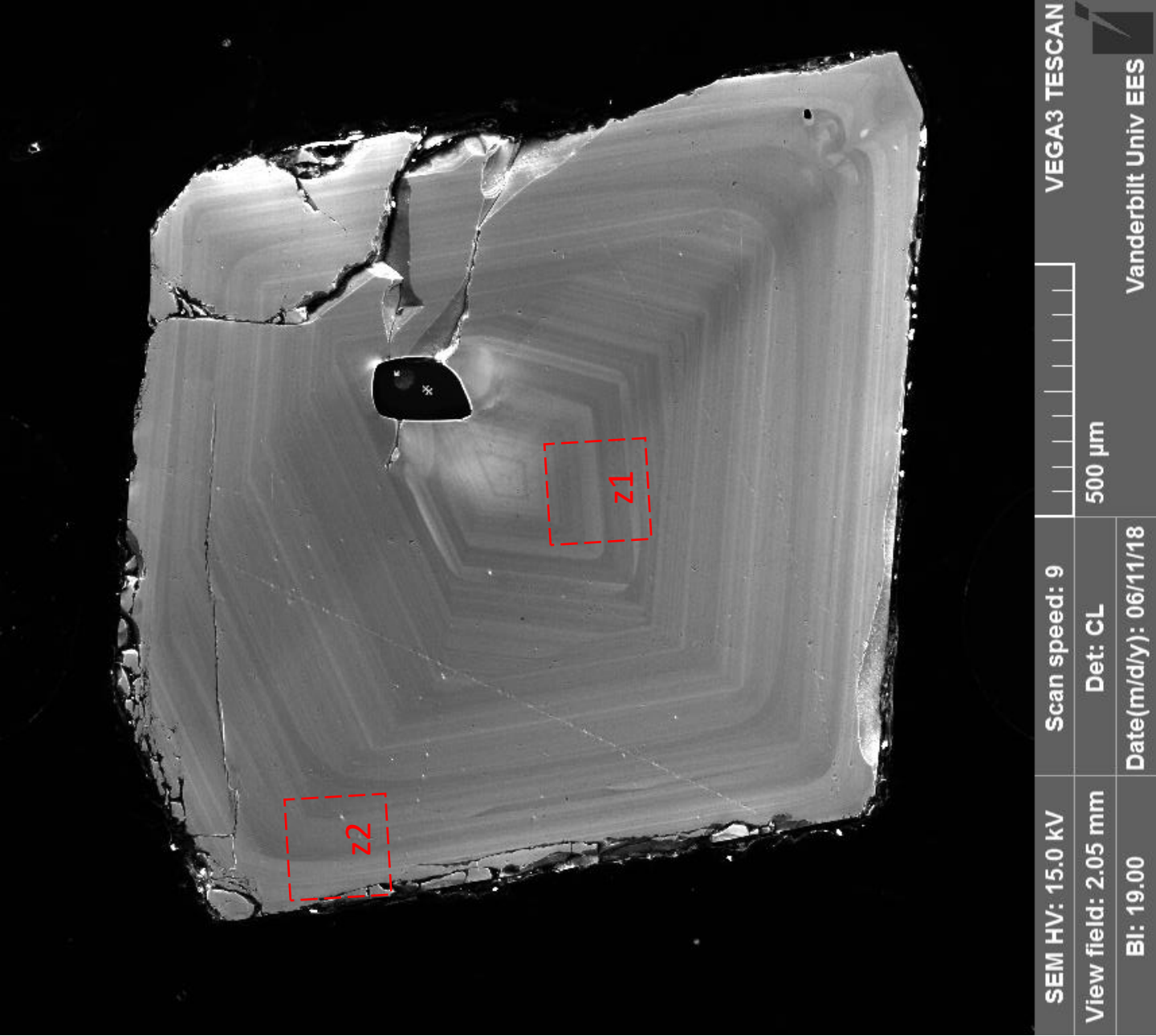


TOKA-3-302-4

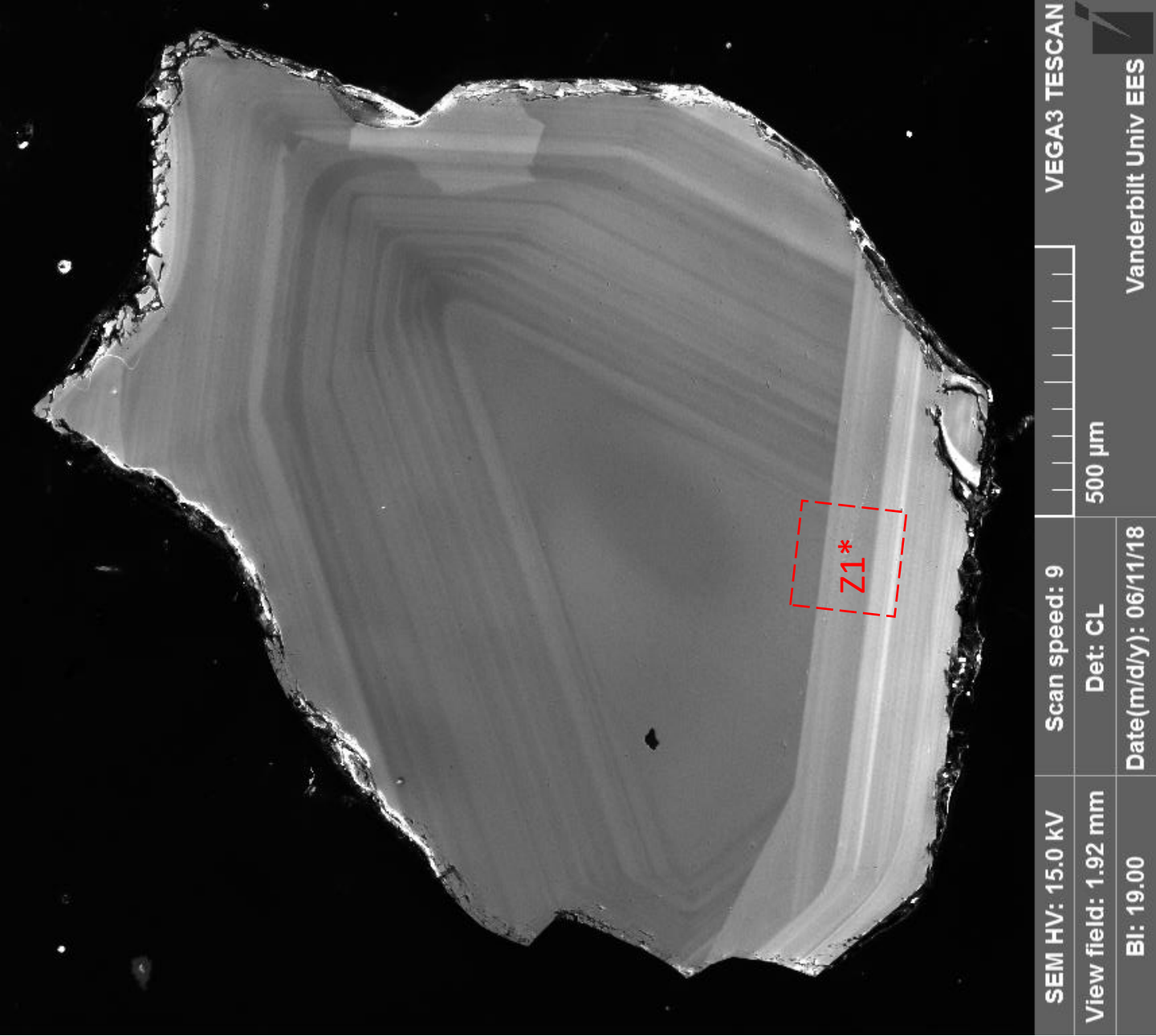


SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 2.19 mm	Det: CL	500 μm
BI: 19.00	Date(m/d/y): 06/11/18	Vanderbilt Univ EES

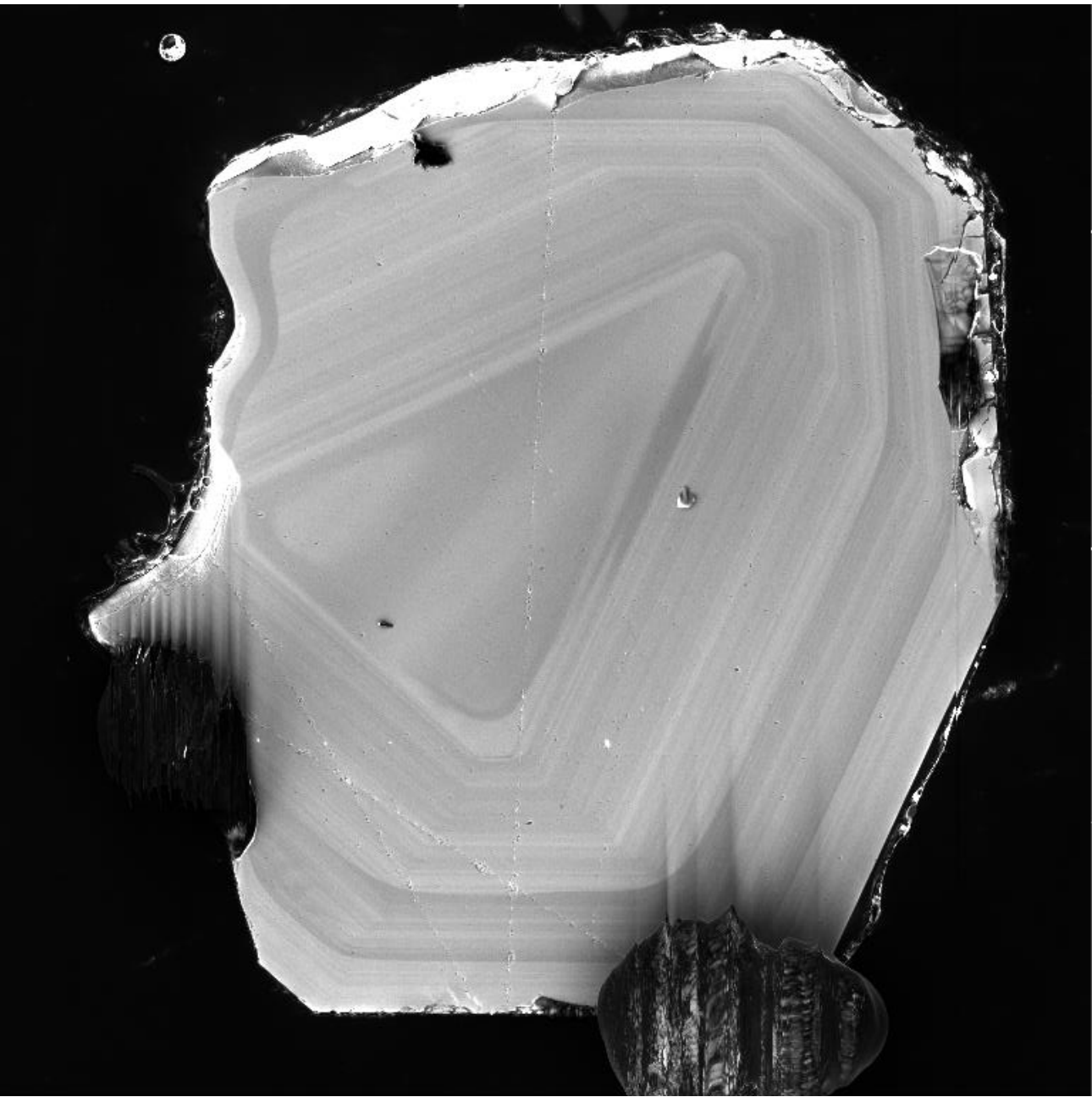
TOKA-3-302-5



TOKA-3-302-6

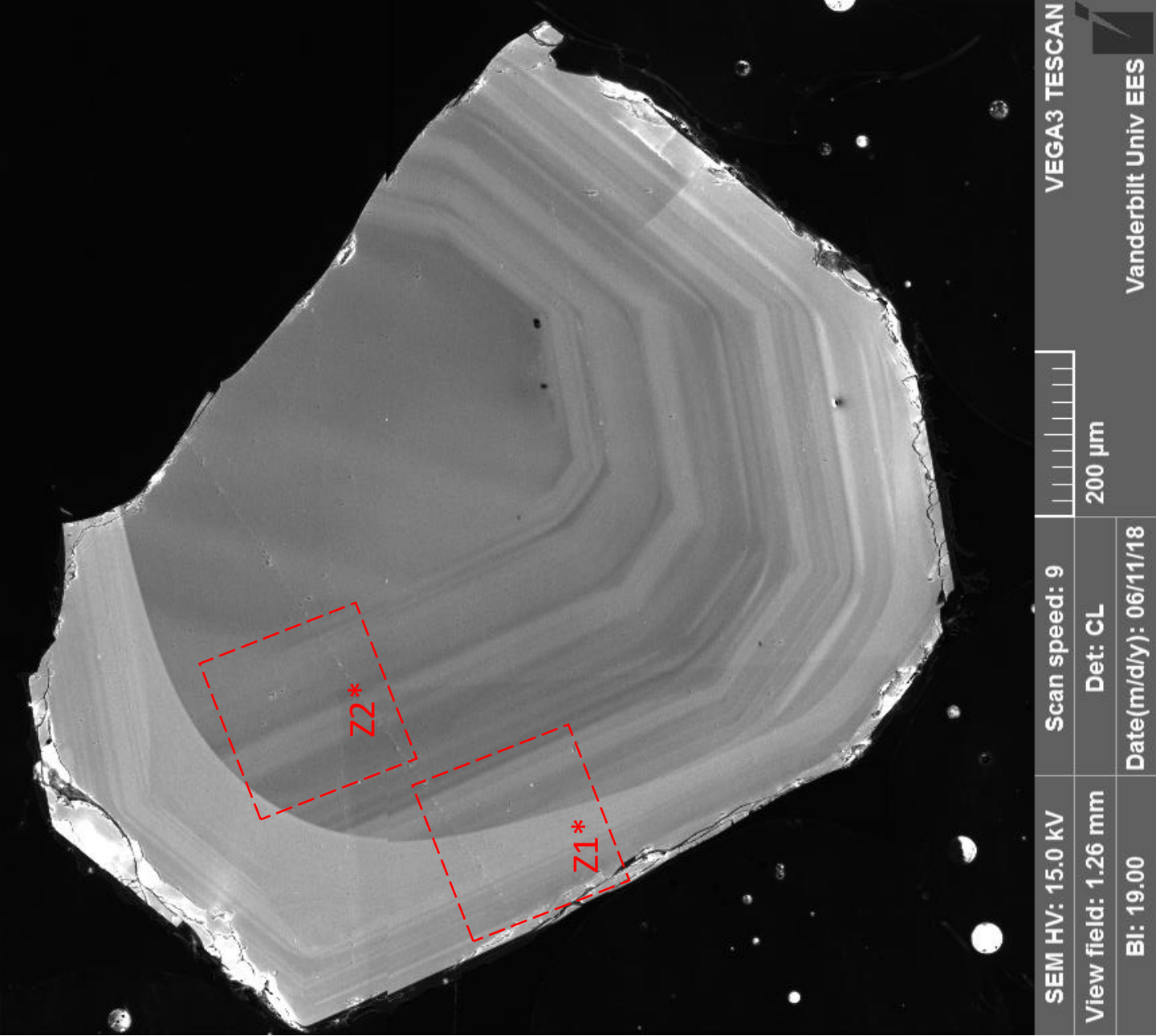


TOKA-3-302-7

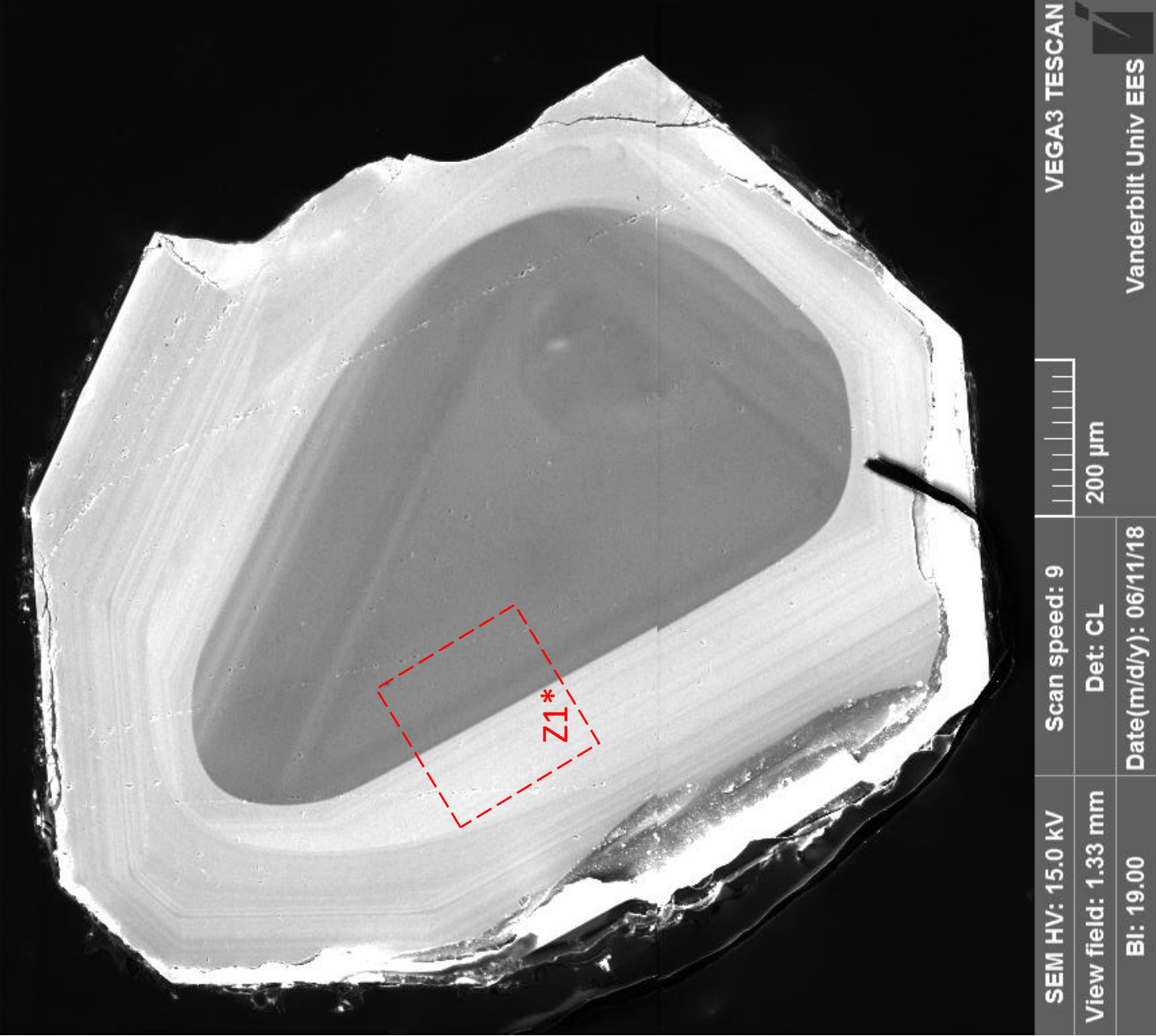


SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.72 mm	Det: CL	500 µm
BI: 19.00	Date(m/d/y): 06/11/18	Vanderbilt Univ EES

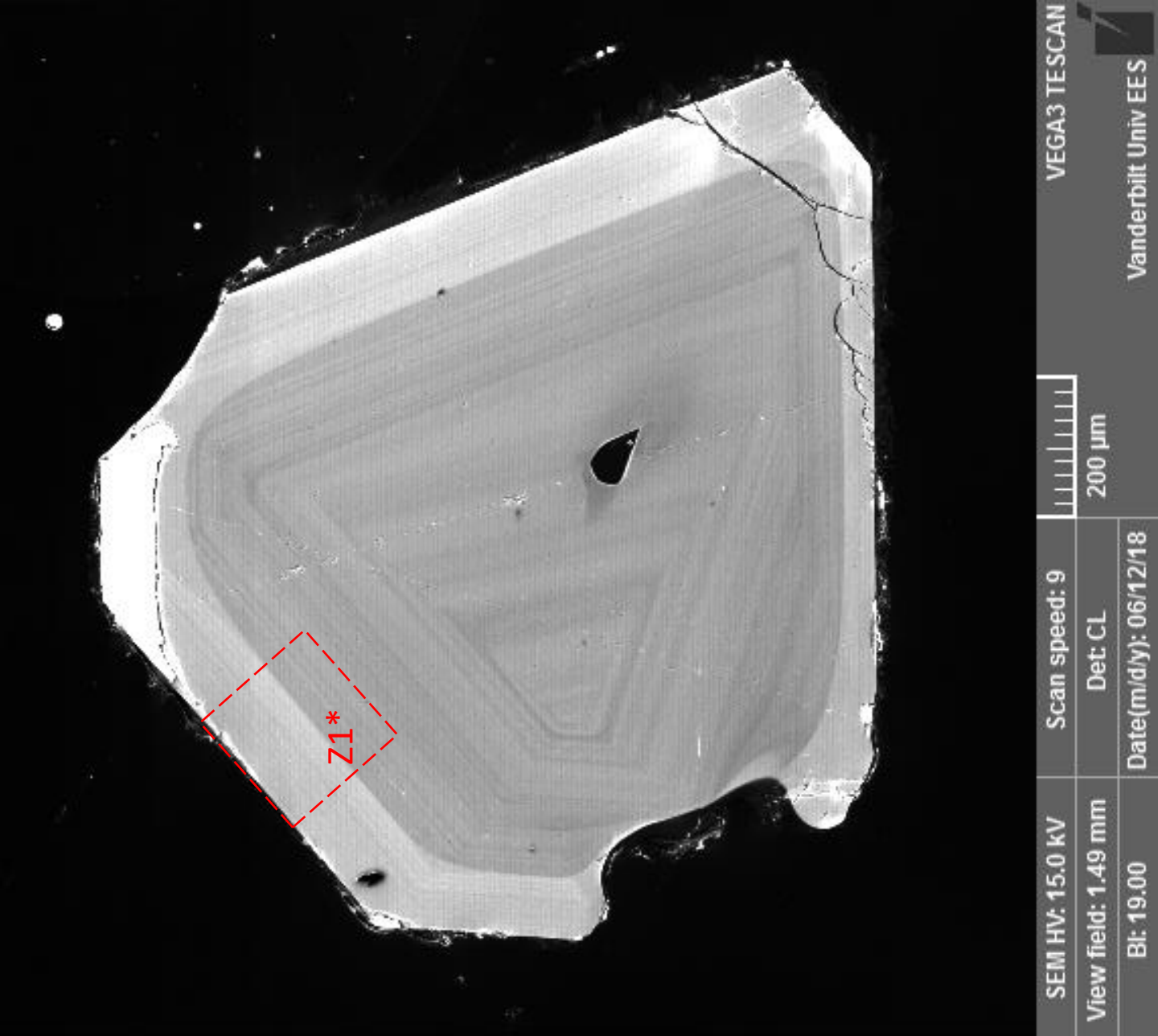
TOKA-3-302-8



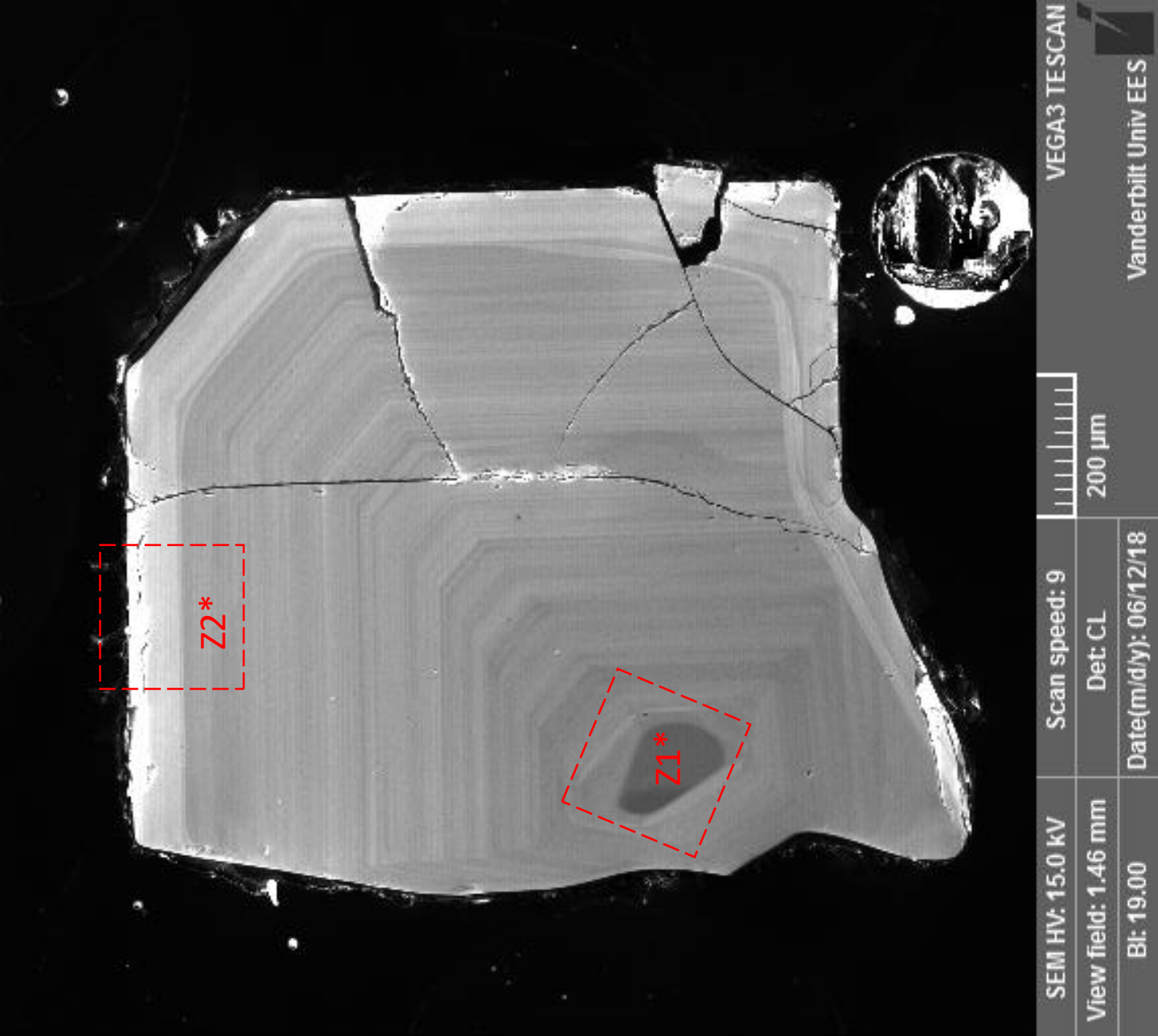
TOKA-3-302-9



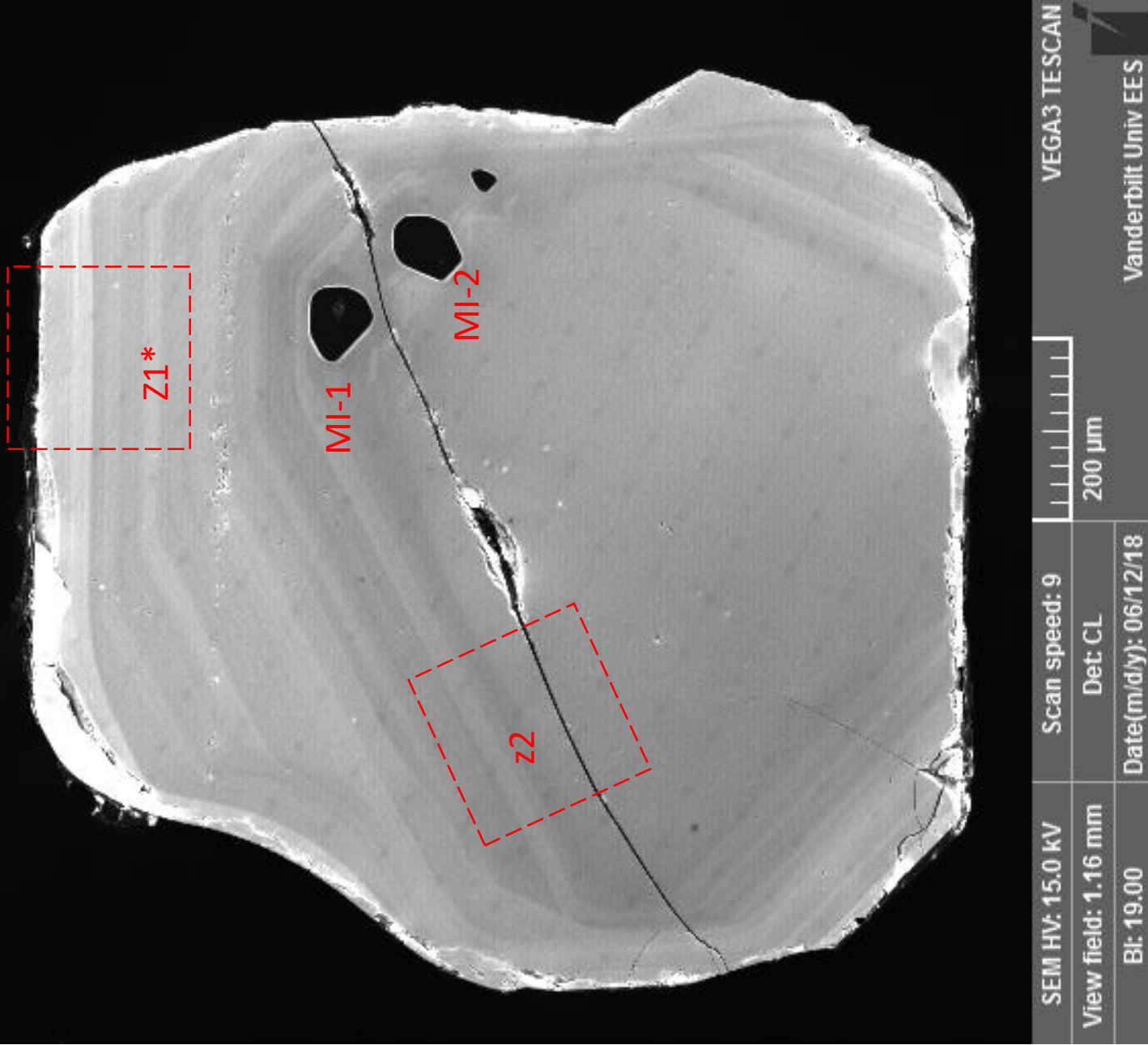
TOKA-3-302-10



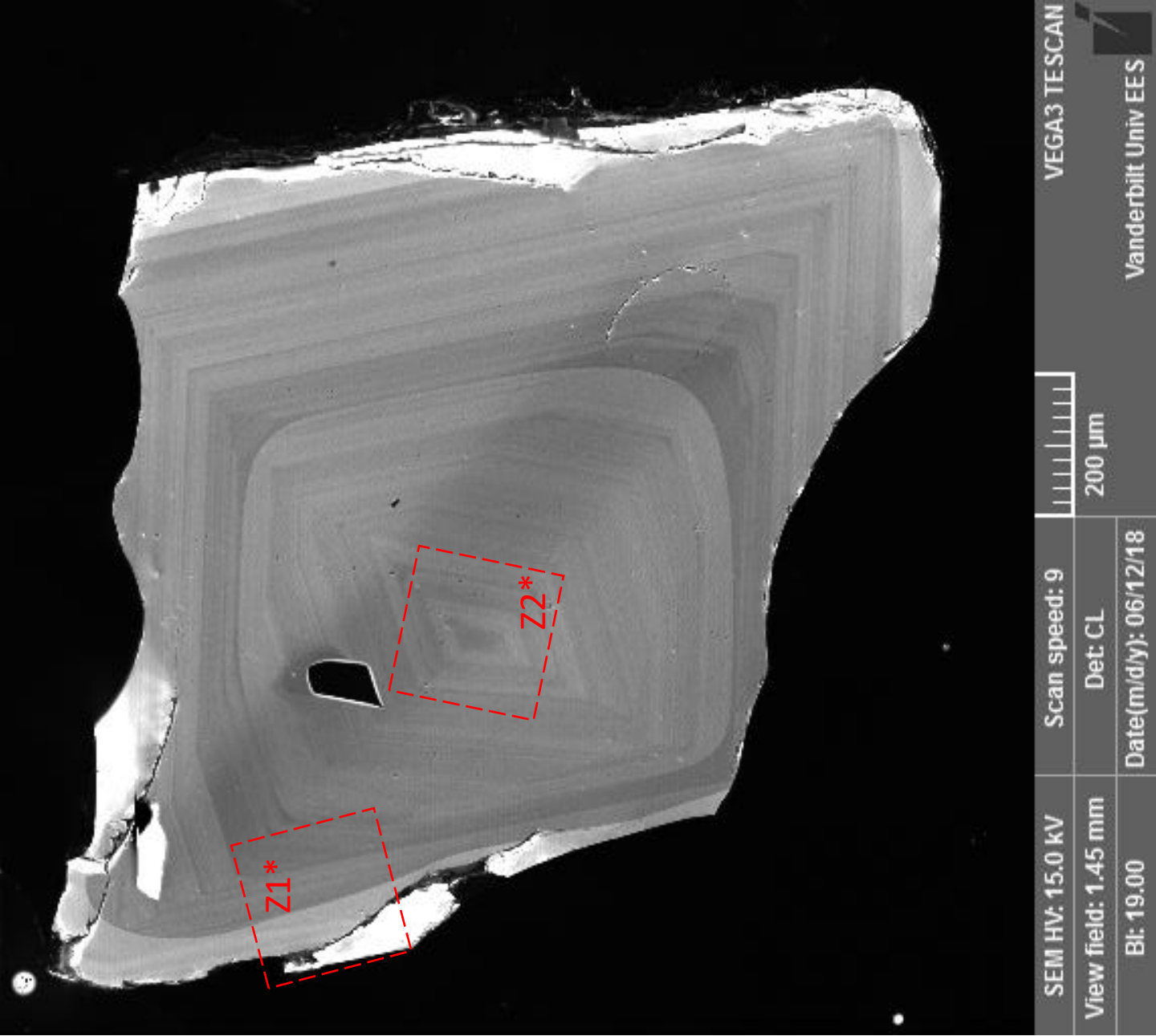
TOKA-3-302-11



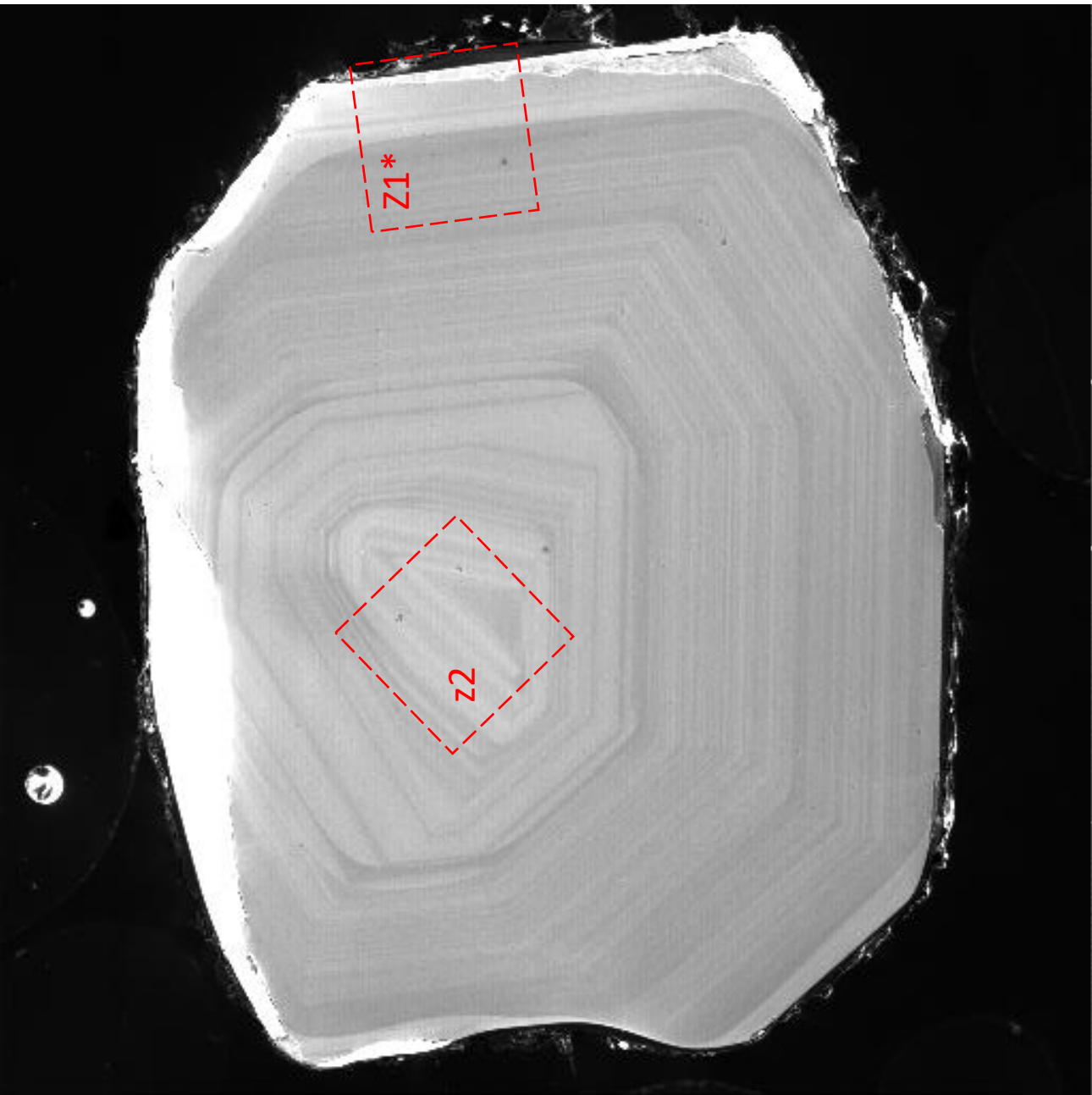
TOKA-3-302-12



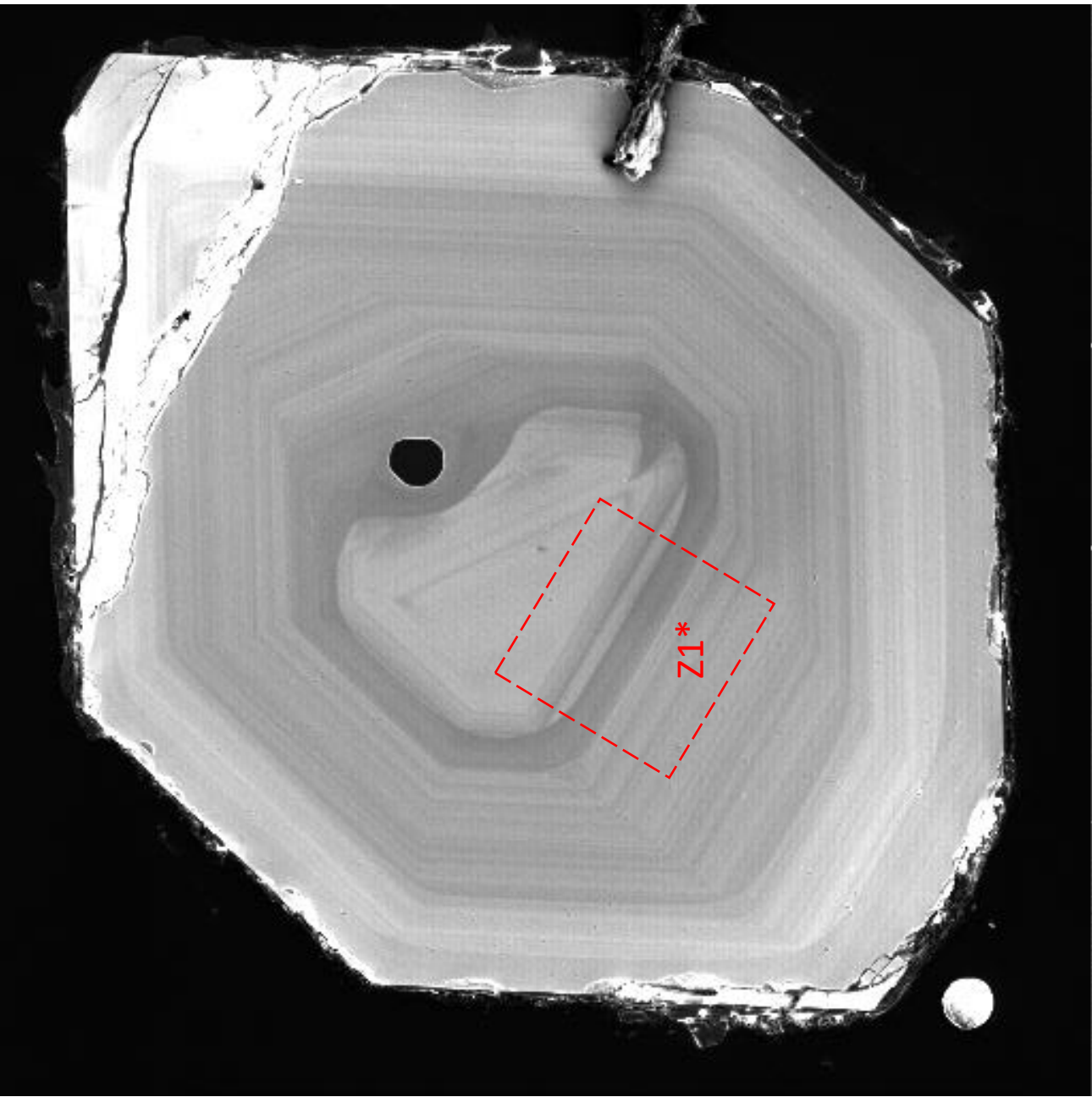
TOKA-3-302-13



TOKA-3-302-14

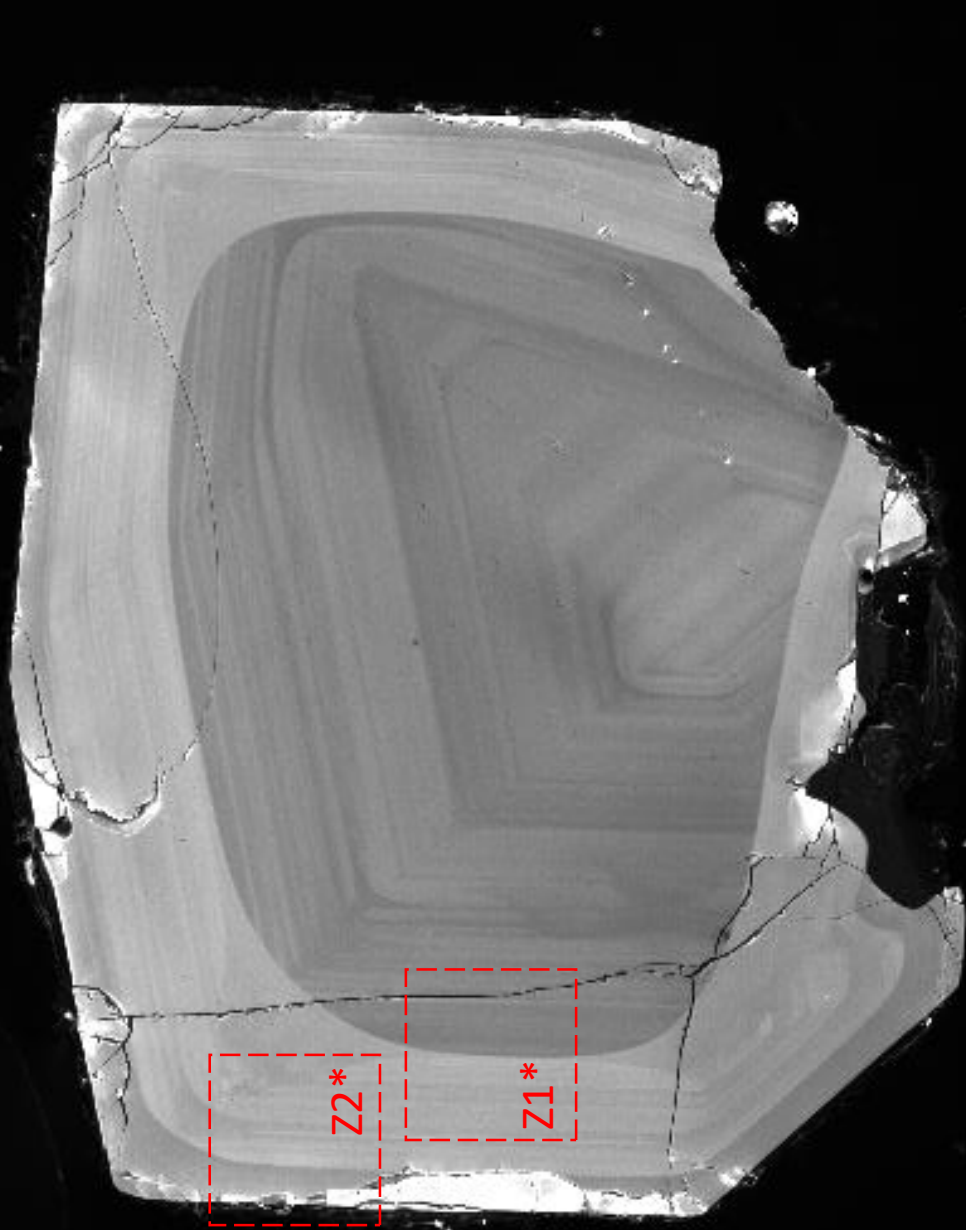


TOKA-3-302-15



SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.08 mm	Det: CL	
BI: 19.00	Date(m/d/y): 06/12/18	Vanderbilt Univ EES

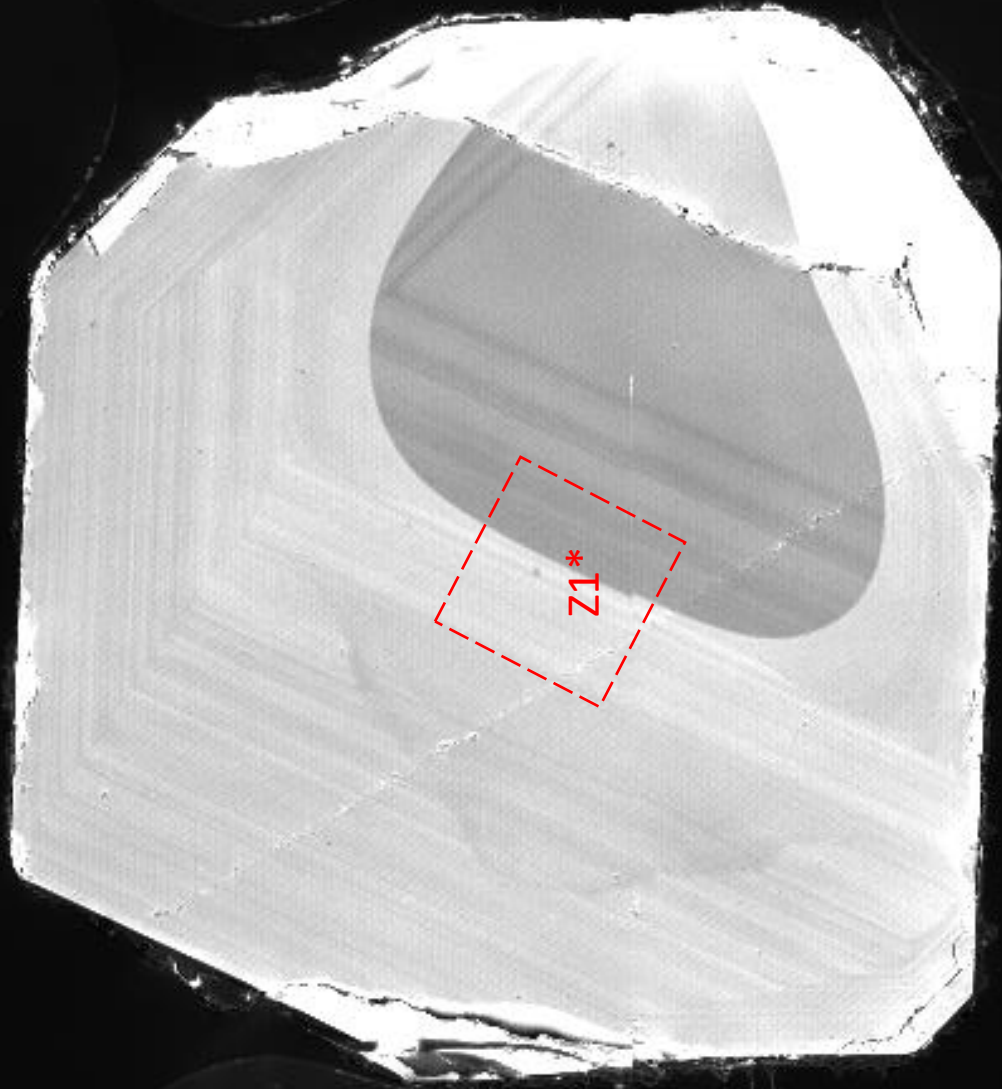
TOKA-3-302-16



SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.49 mm	Det: CL	Vanderbilt Univ EES
BI: 19.00	Date(m/d/y): 06/12/18	

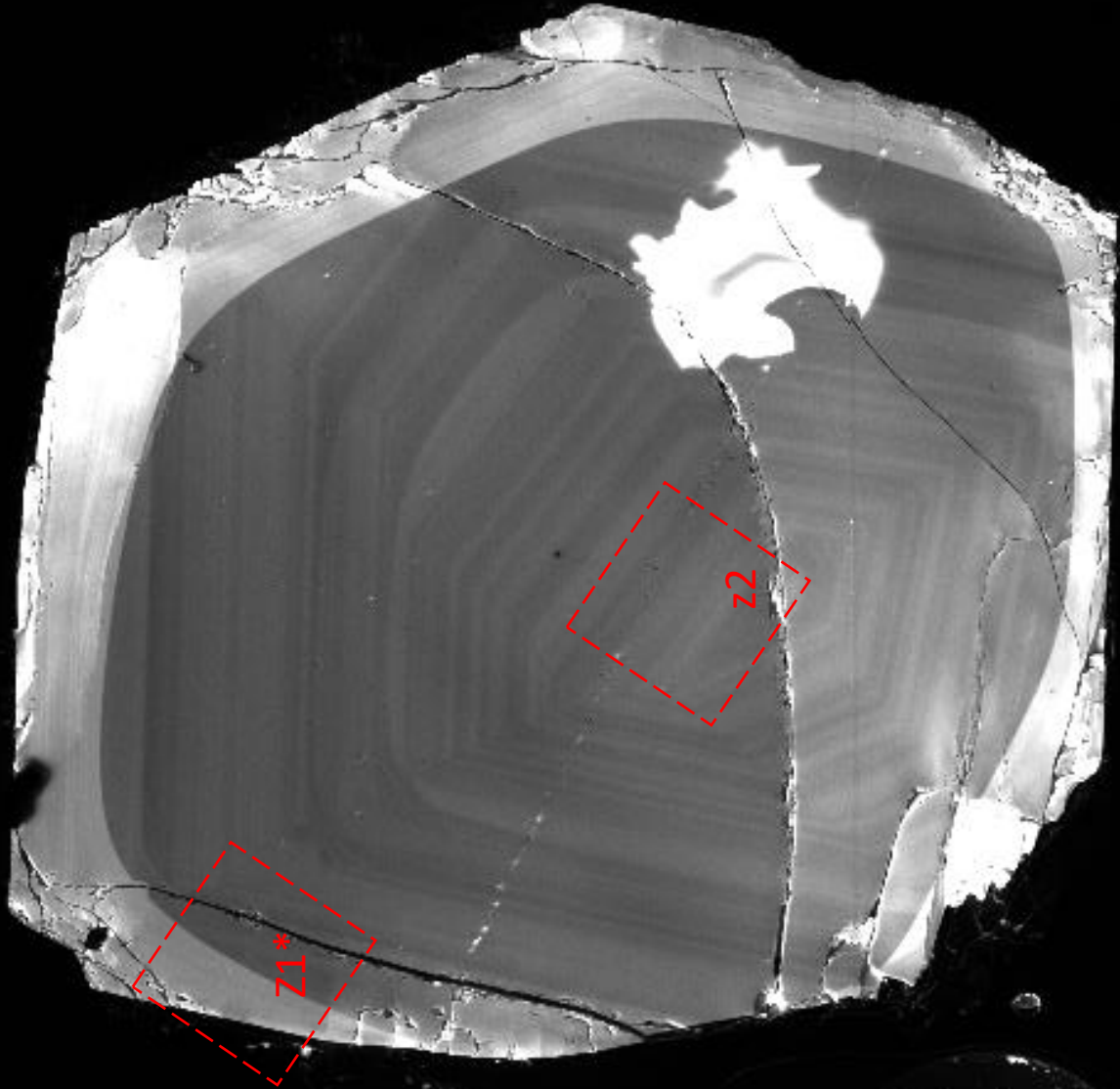
200 μm

TOKA-3-302-18



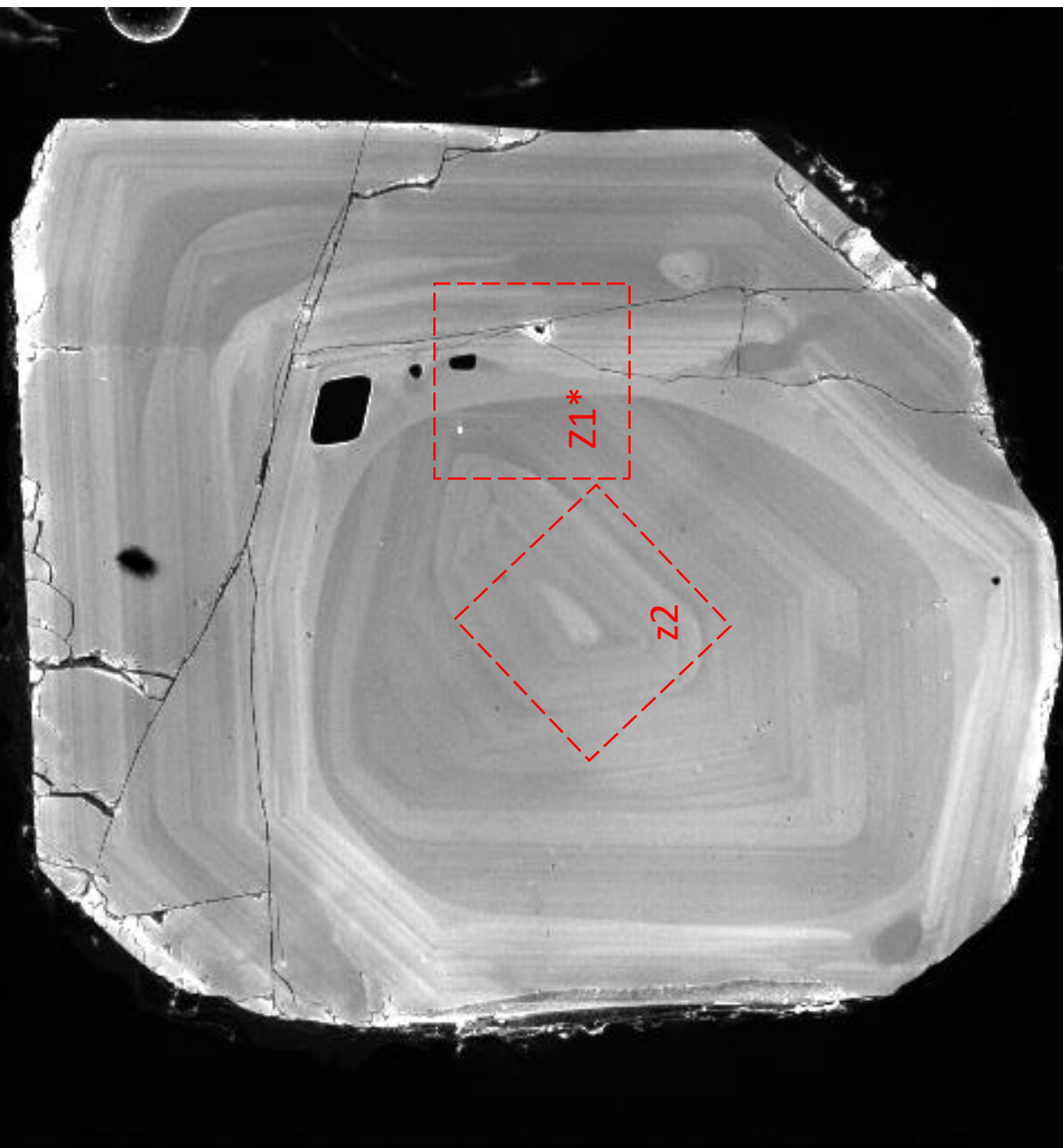
SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.40 mm	Det: CL	200 μm
BI: 19.00	Date(m/d/y): 06/12/18	Vanderbilt Univ EES

TOKA-3-302-19



SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.44 mm	Det: CL	200 μm
BI: 19.00	Date(m/d/y): 06/12/18	Vanderbilt Univ EES

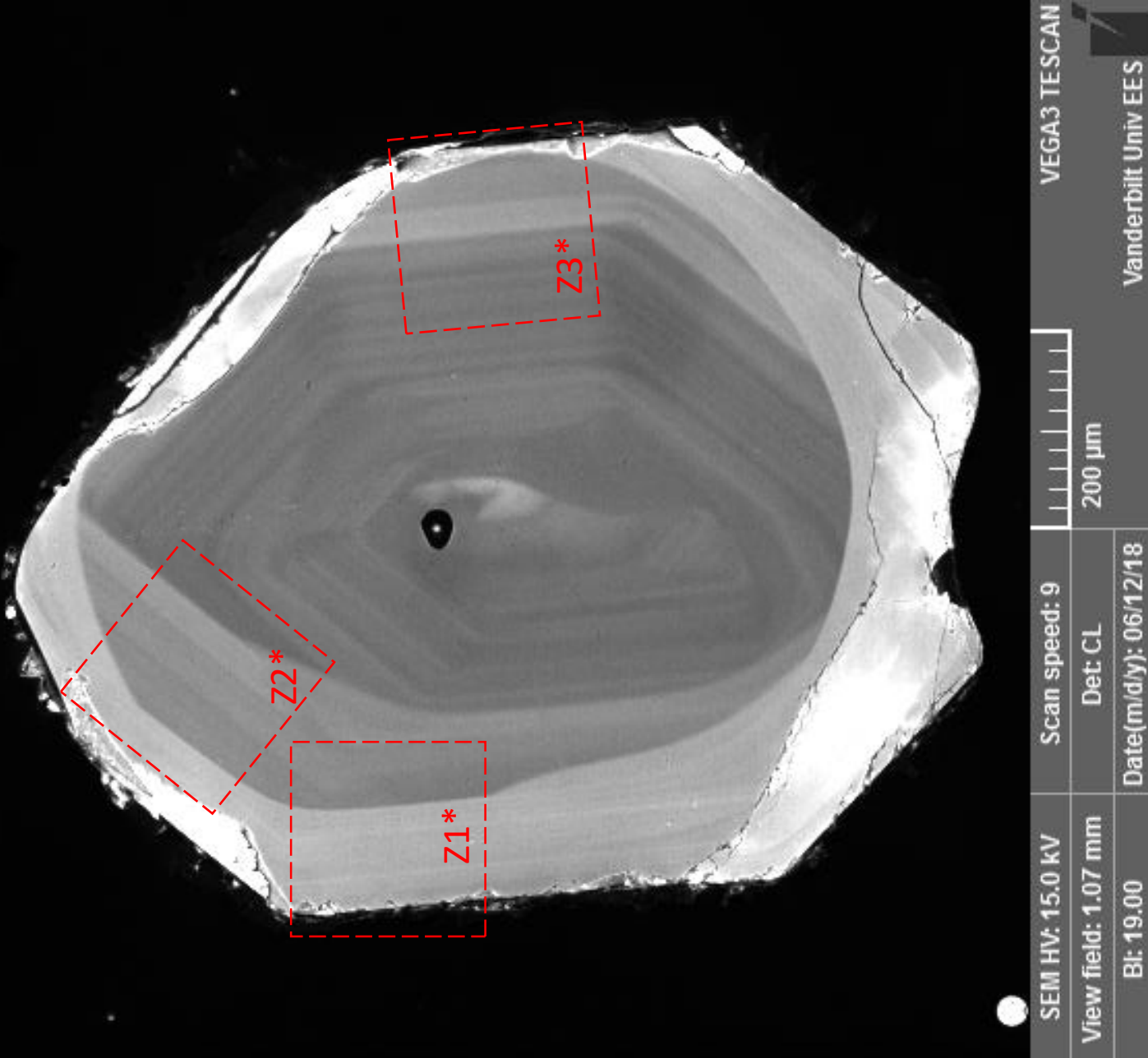
TOKA-3-302-20



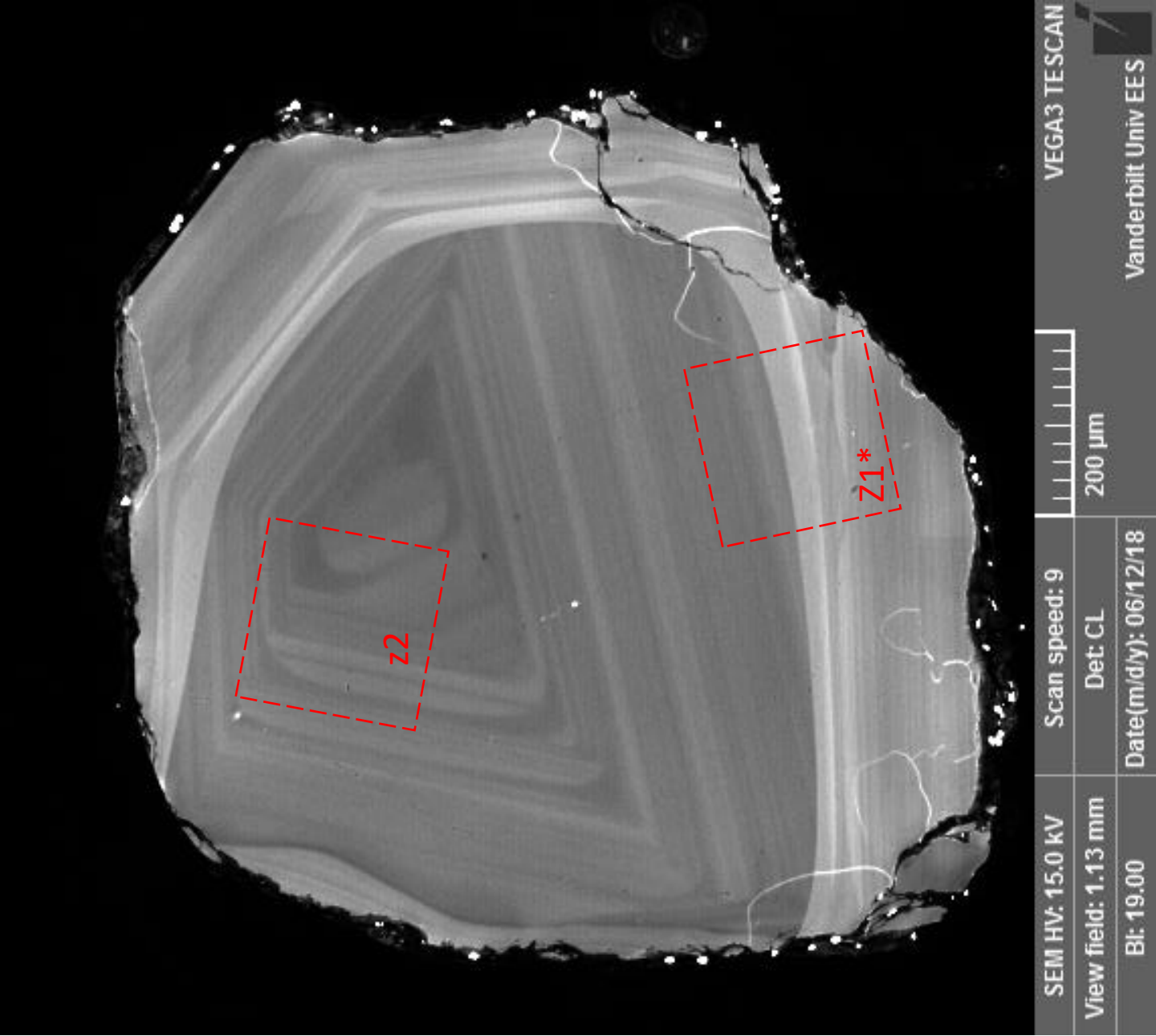
SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.18 mm	Det: CL	Vanderbilt Univ EES
BI: 19.00	Date(m/d/y): 06/12/18	

200 μm

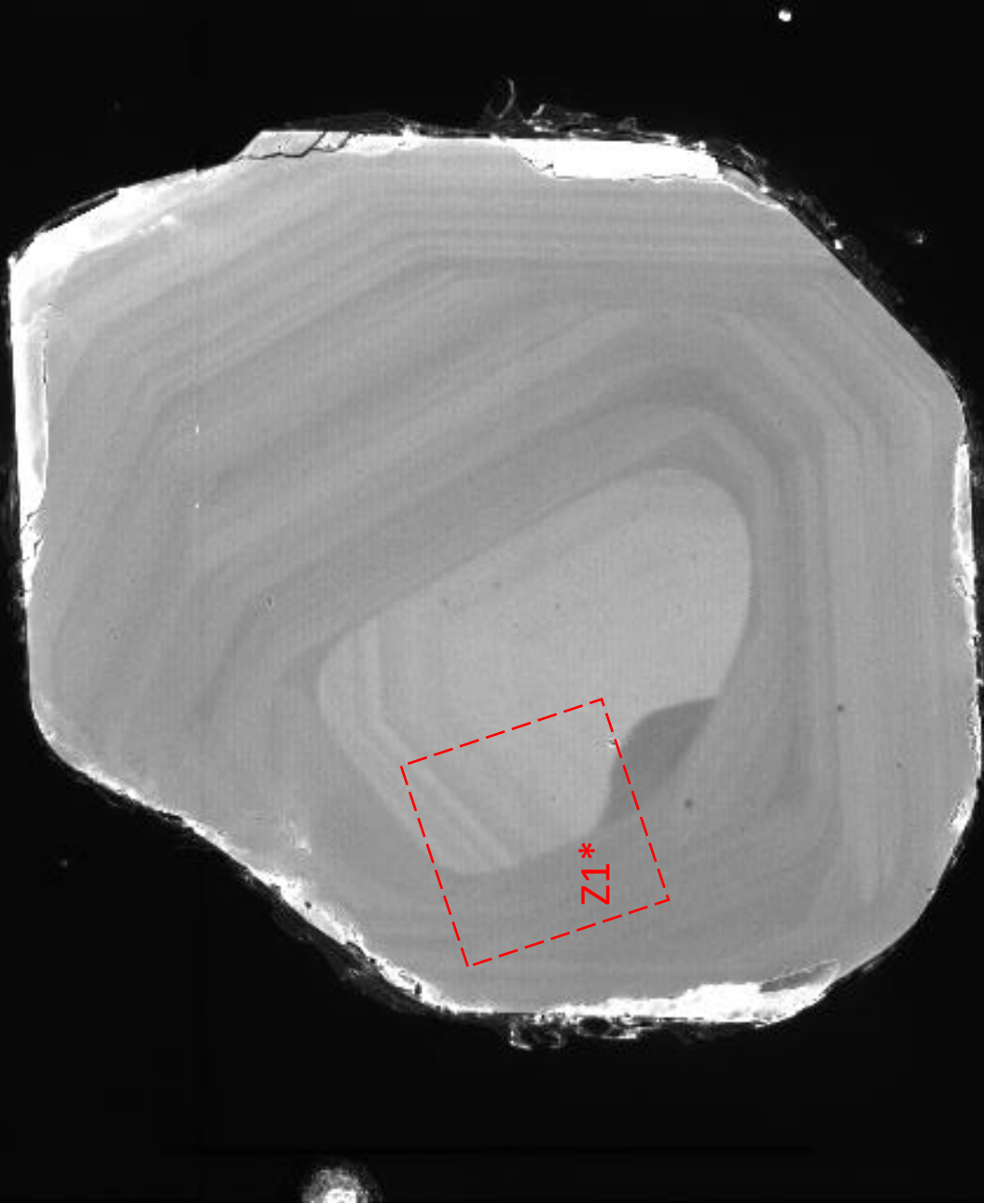
TOKA-3-302-21



TOKA-3-302-22



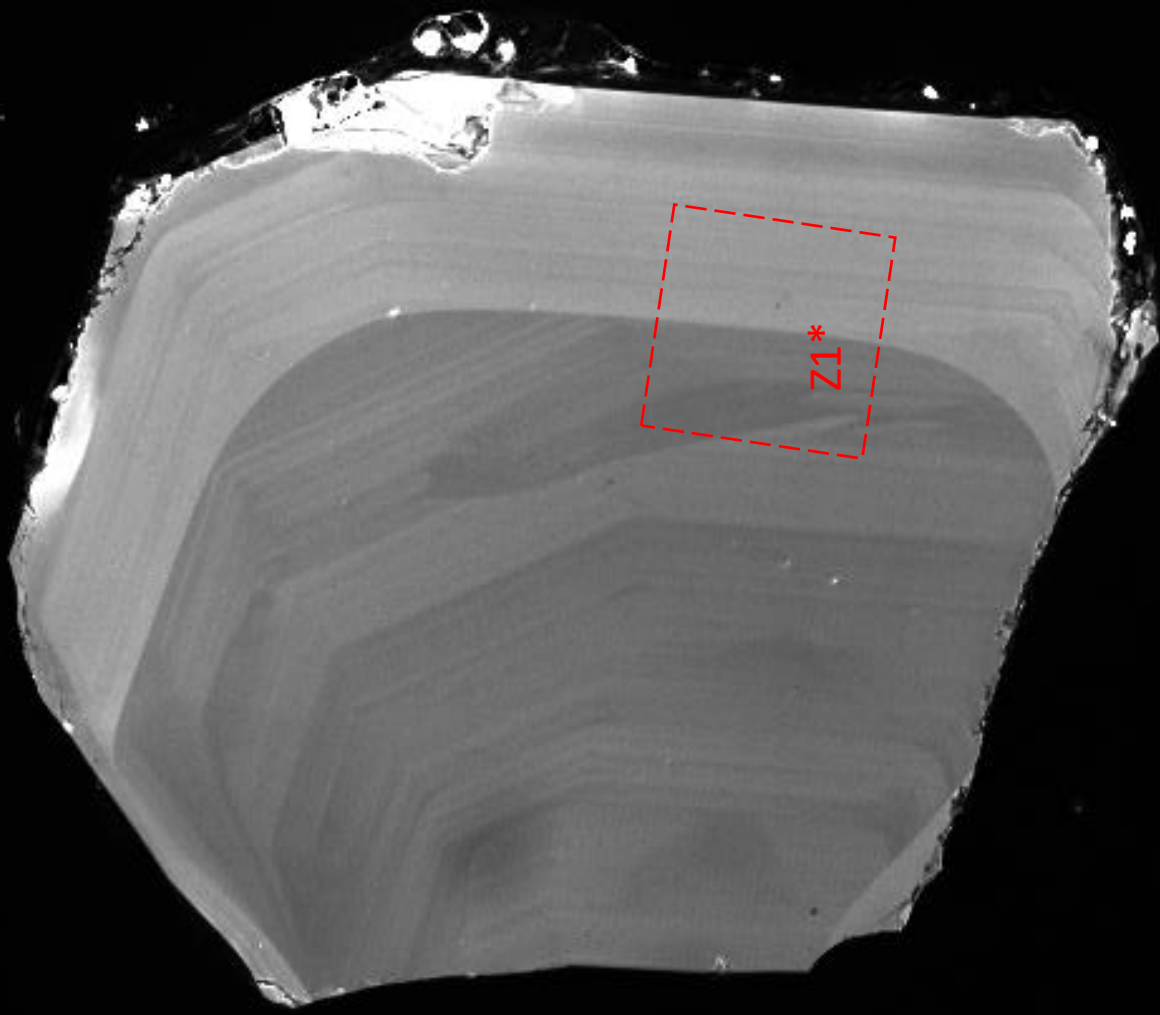
TOKA-3-302-23



SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.16 mm	Det: CL	Vanderbilt Univ EES
BI: 19.00	Date(m/d/y): 06/12/18	

200 μm

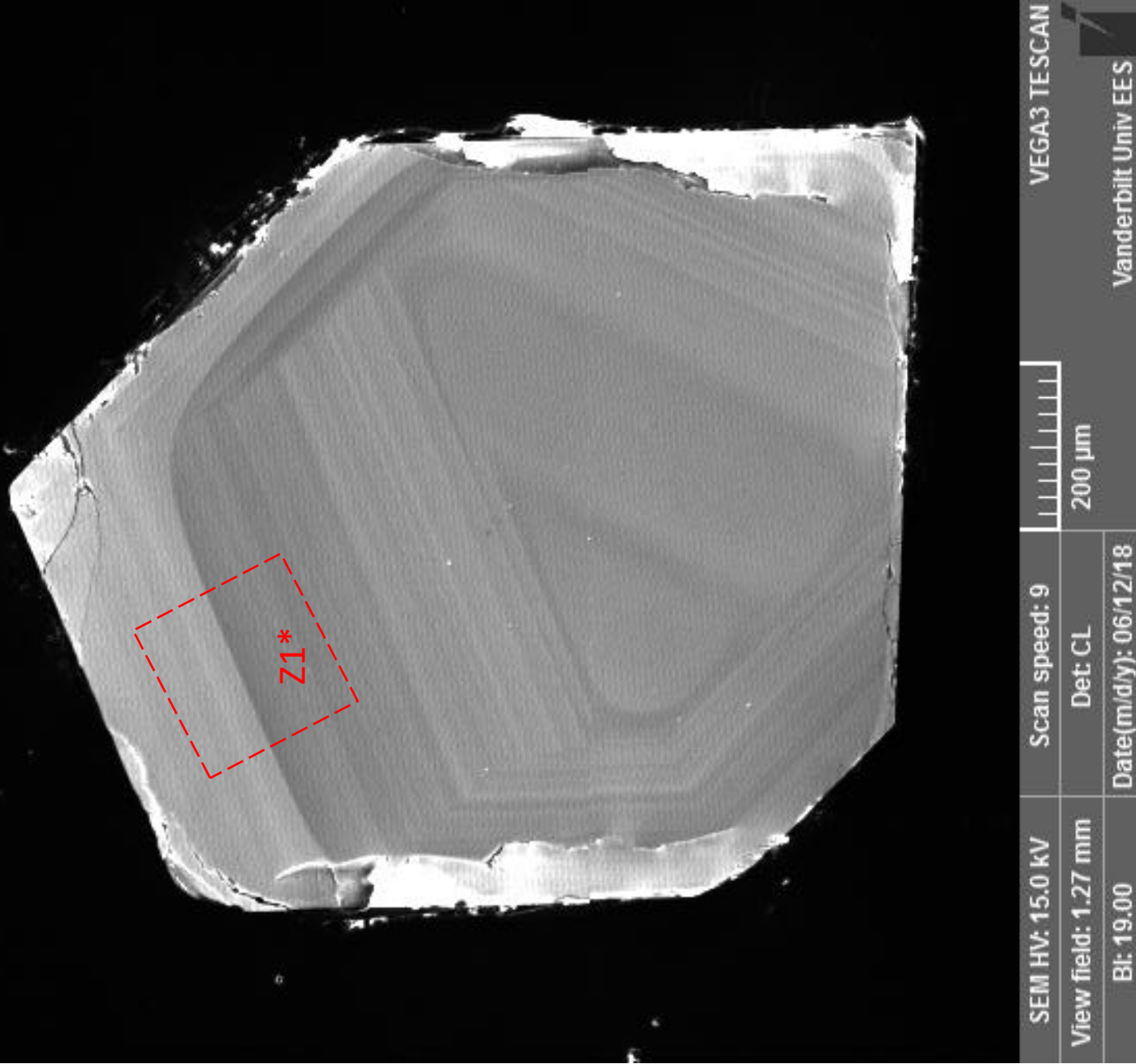
TOKA-3-302-24



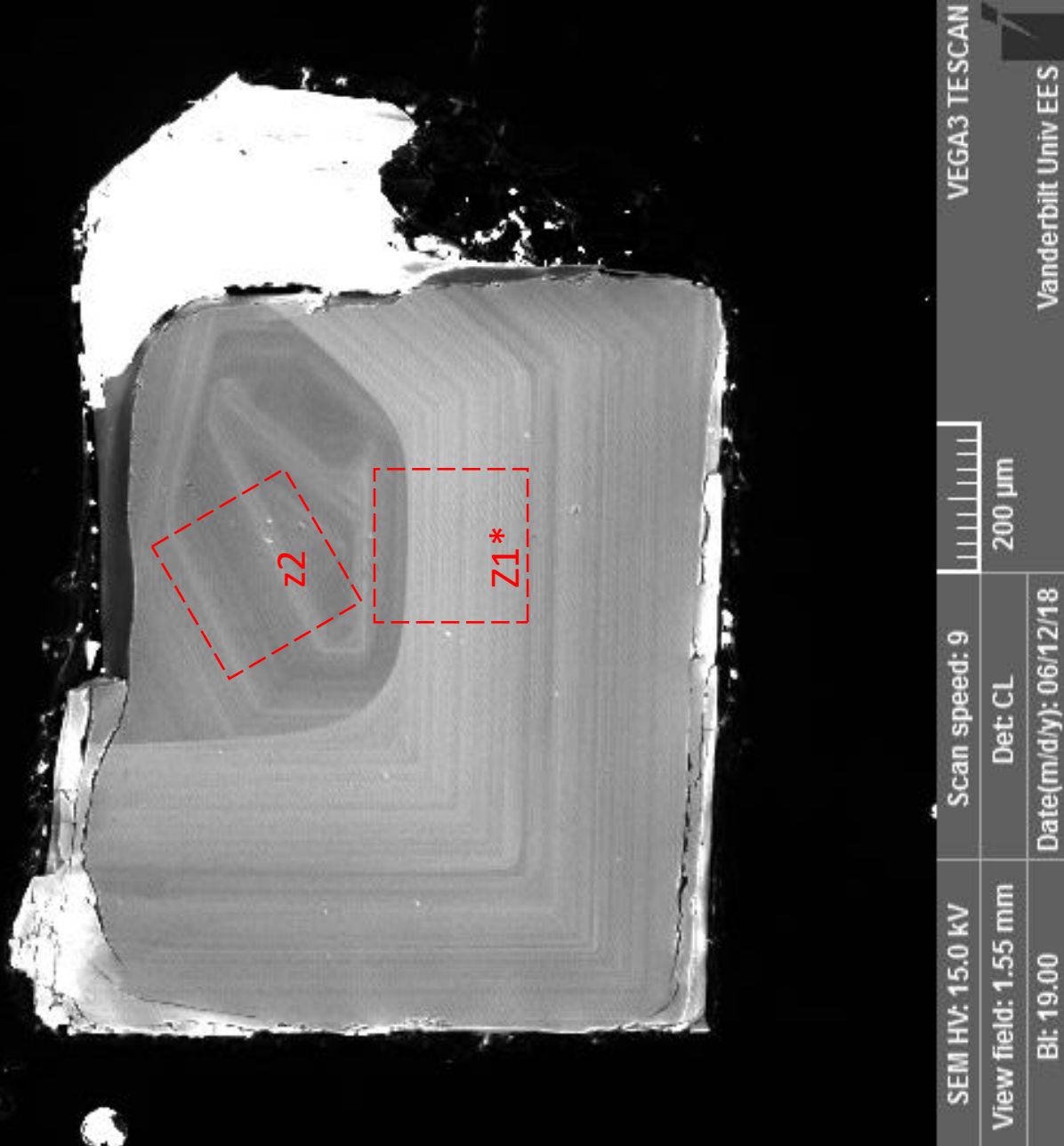
SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.15 mm	Det: CL	Vanderbilt Univ EES
BI: 19.00	Date(m/d/y): 06/12/18	

200 μm

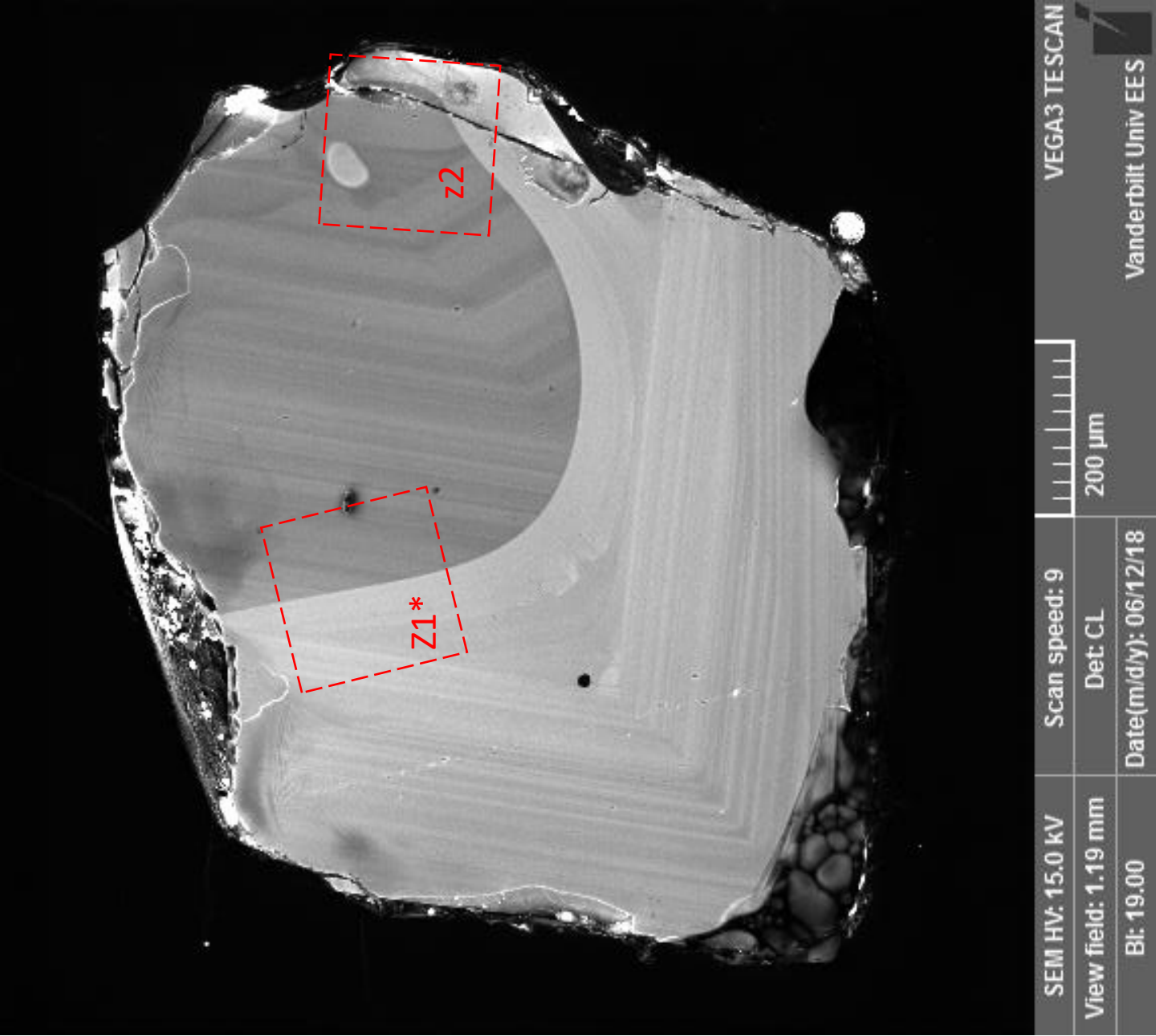
TOKA-3-302-25



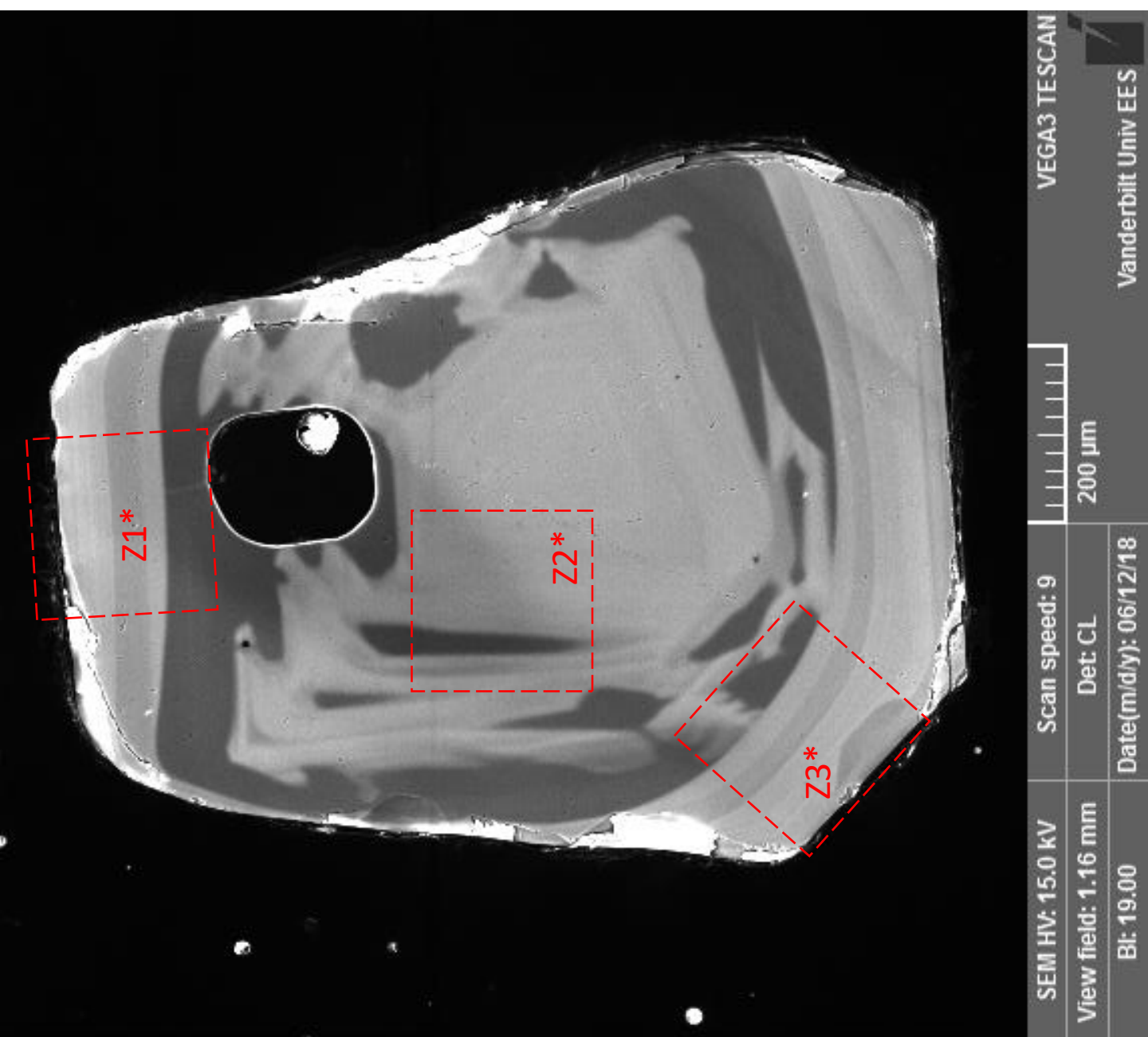
TOKA-3-302-26



TOKA-3-302-27

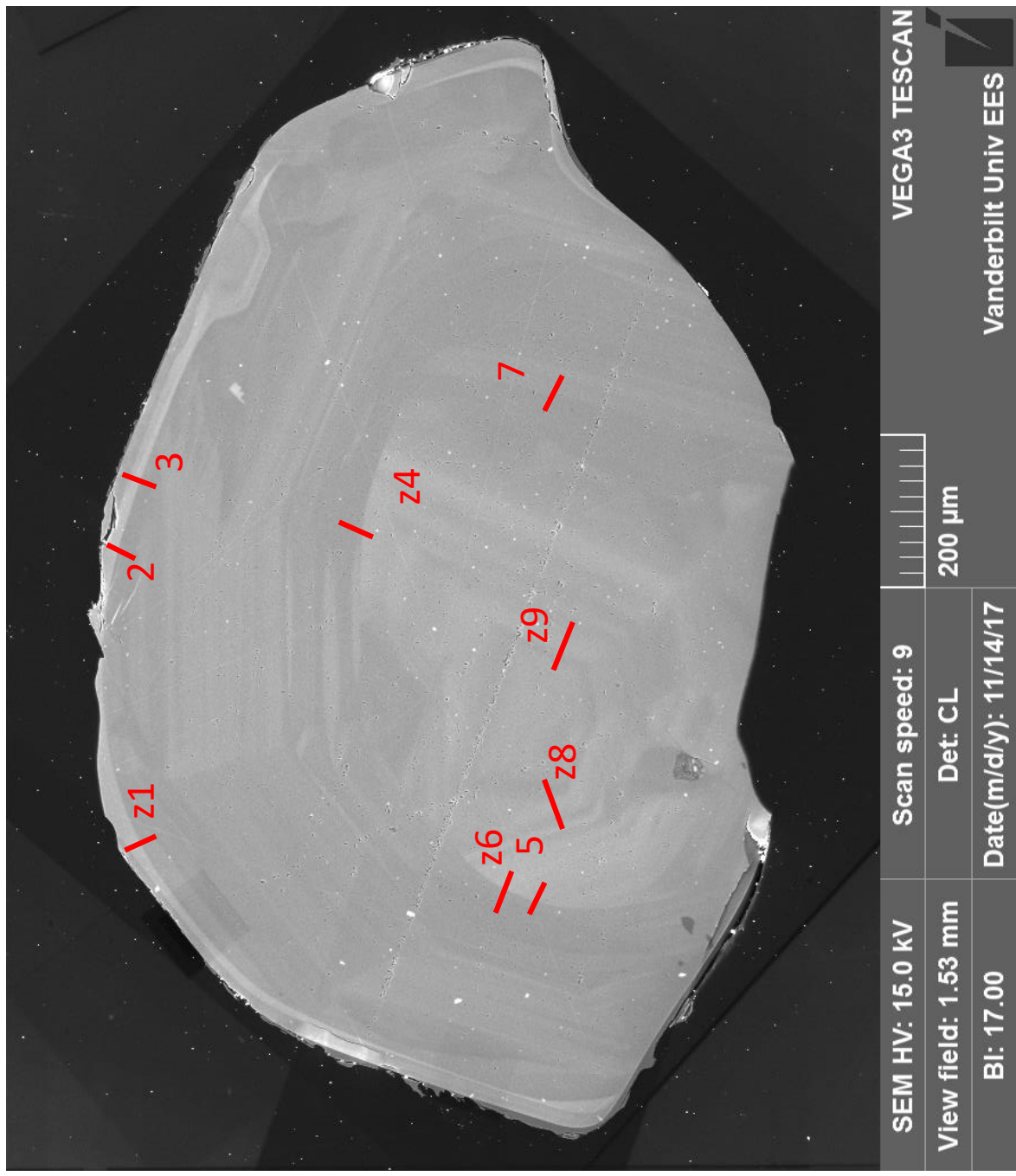


TOKA-3-302-28

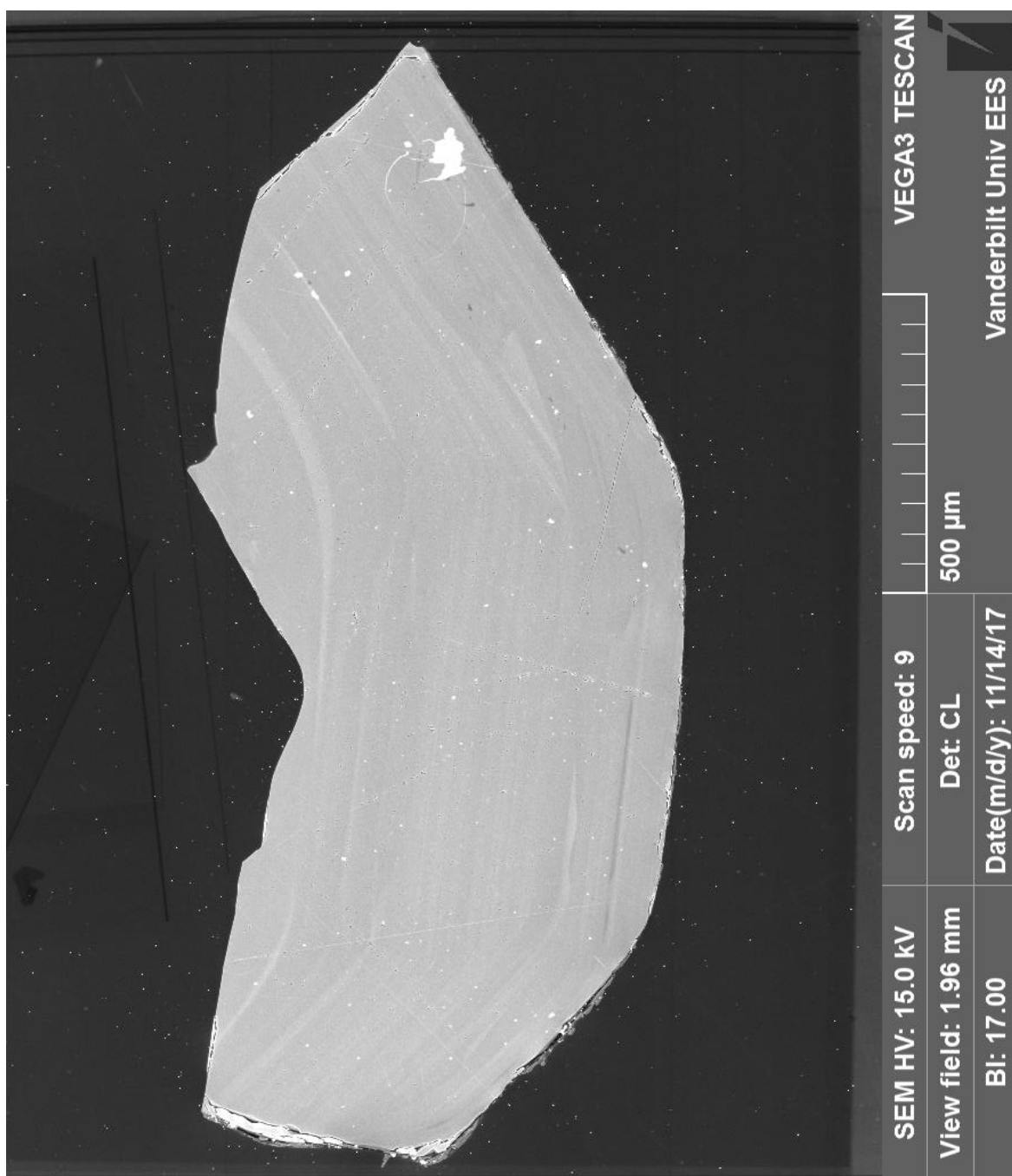


BIEI-3-101

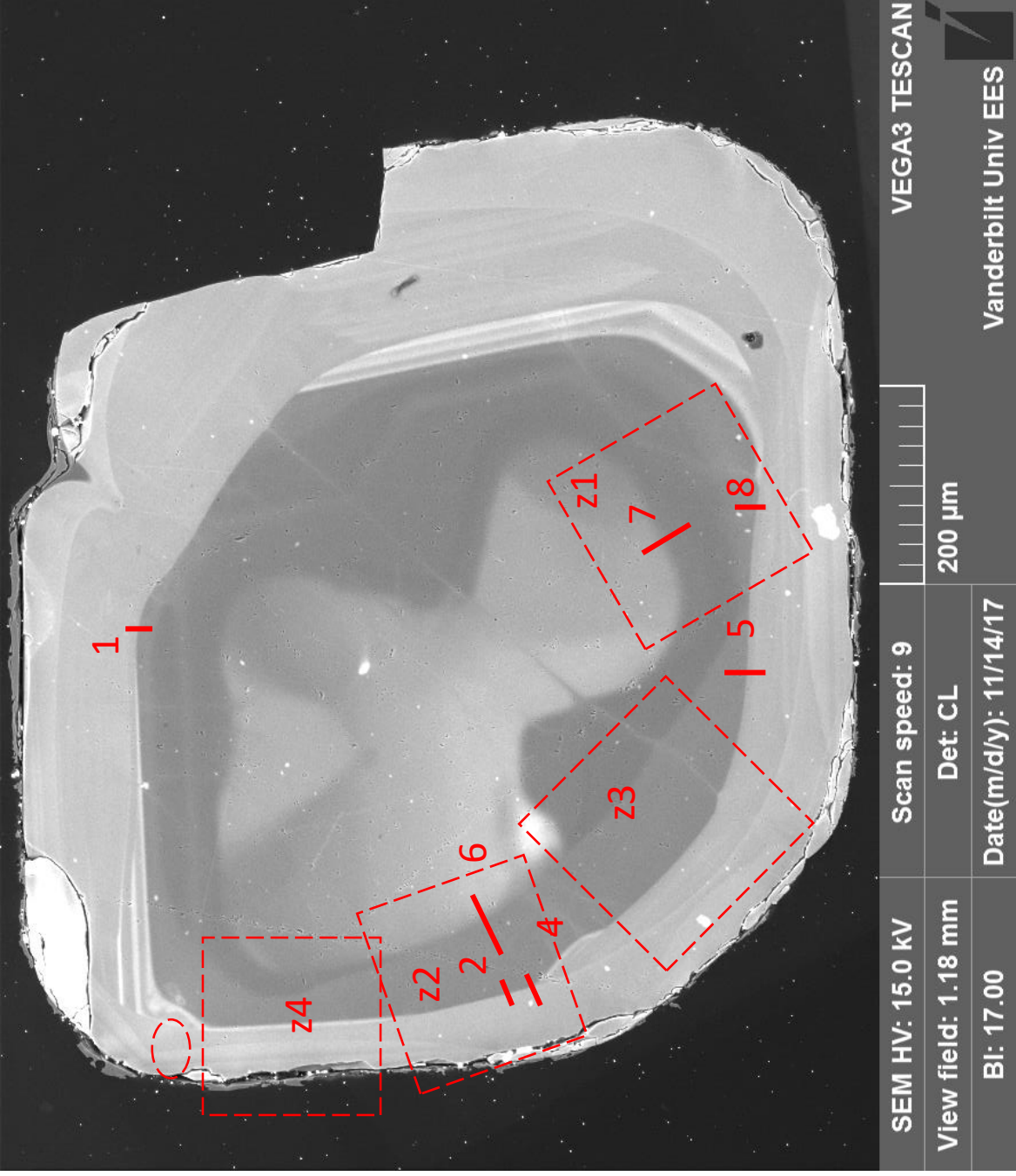
BIEI-3-101-1



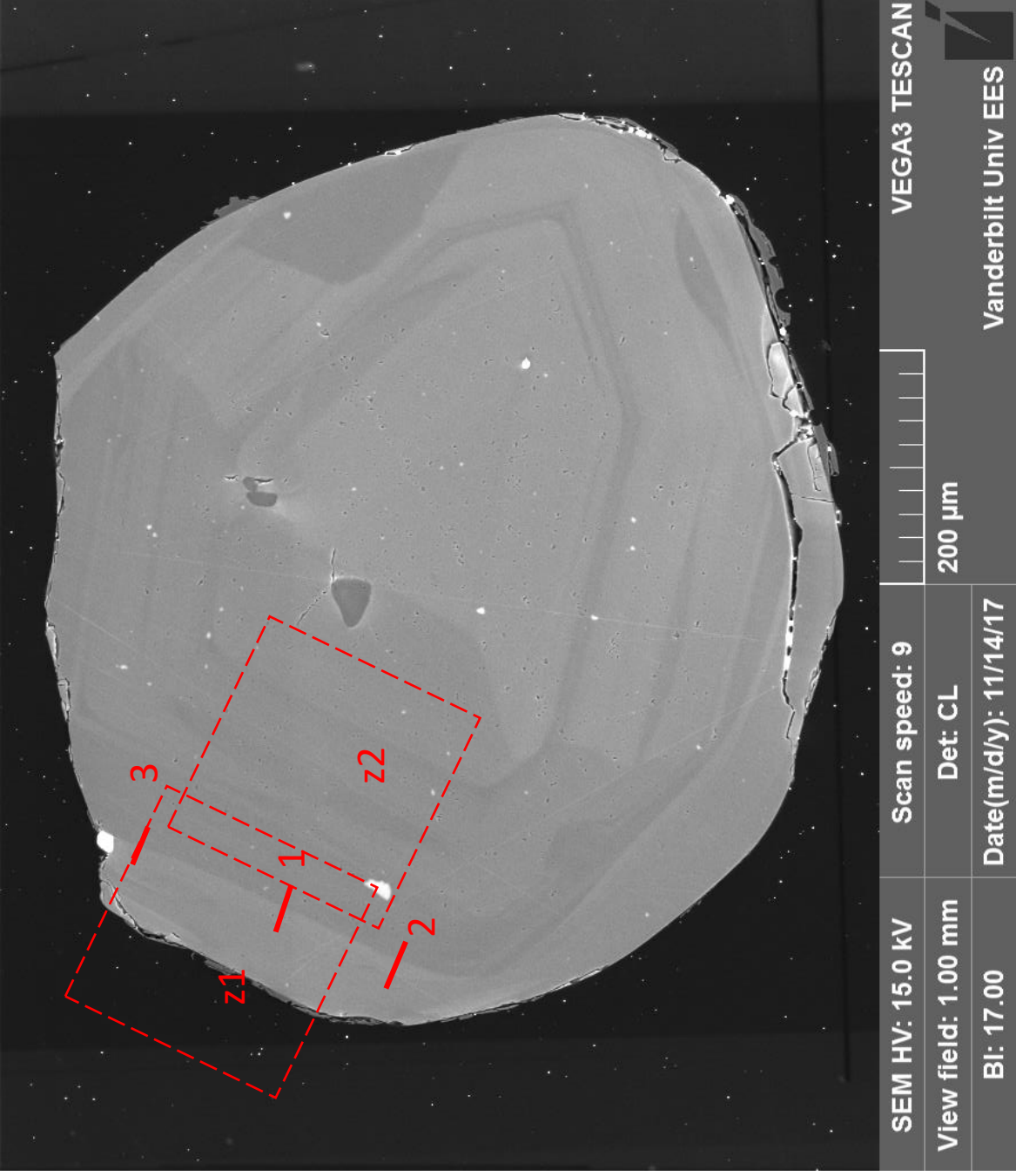
BIEI-3-101-2



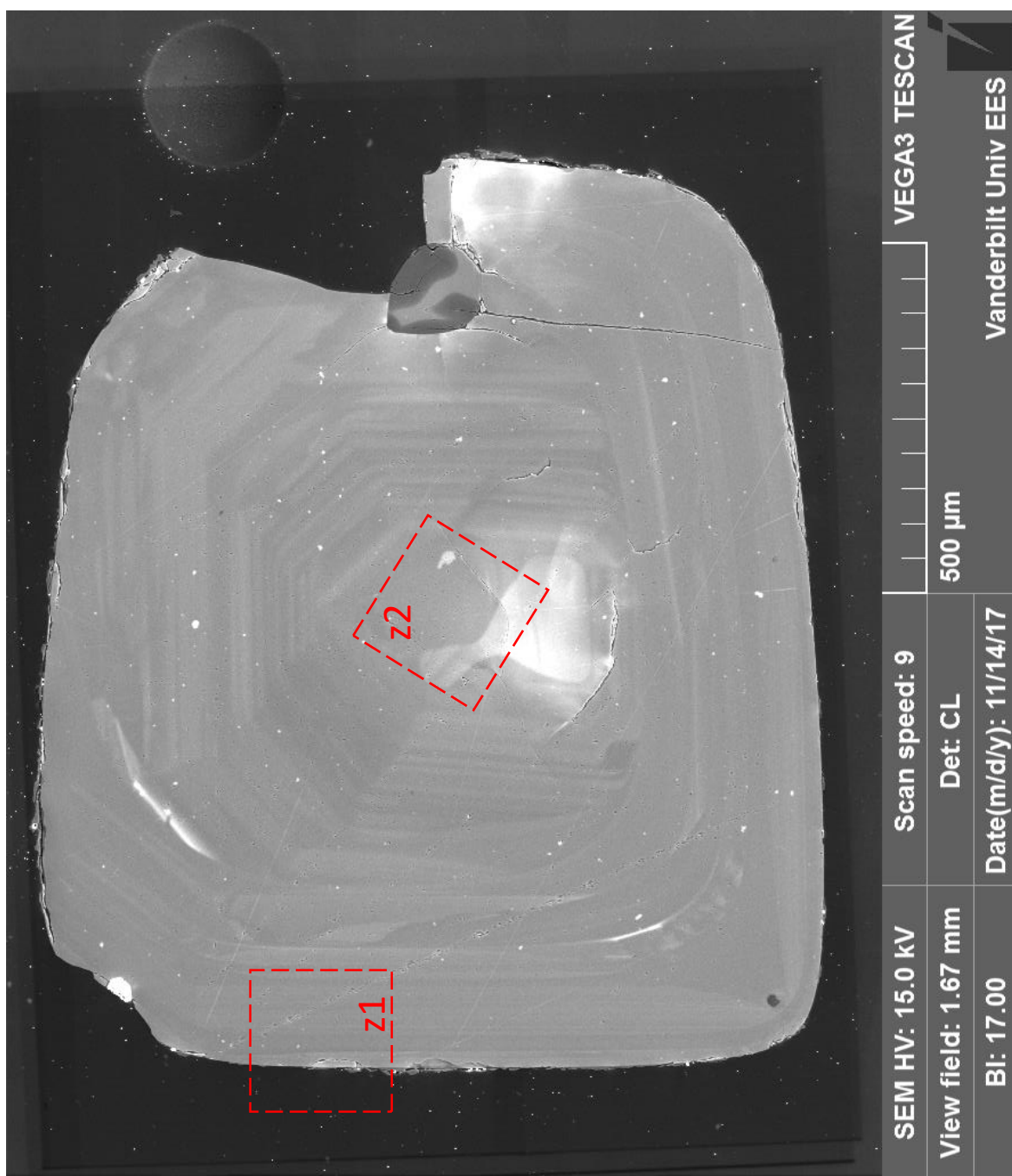
BIEI-3-101-3



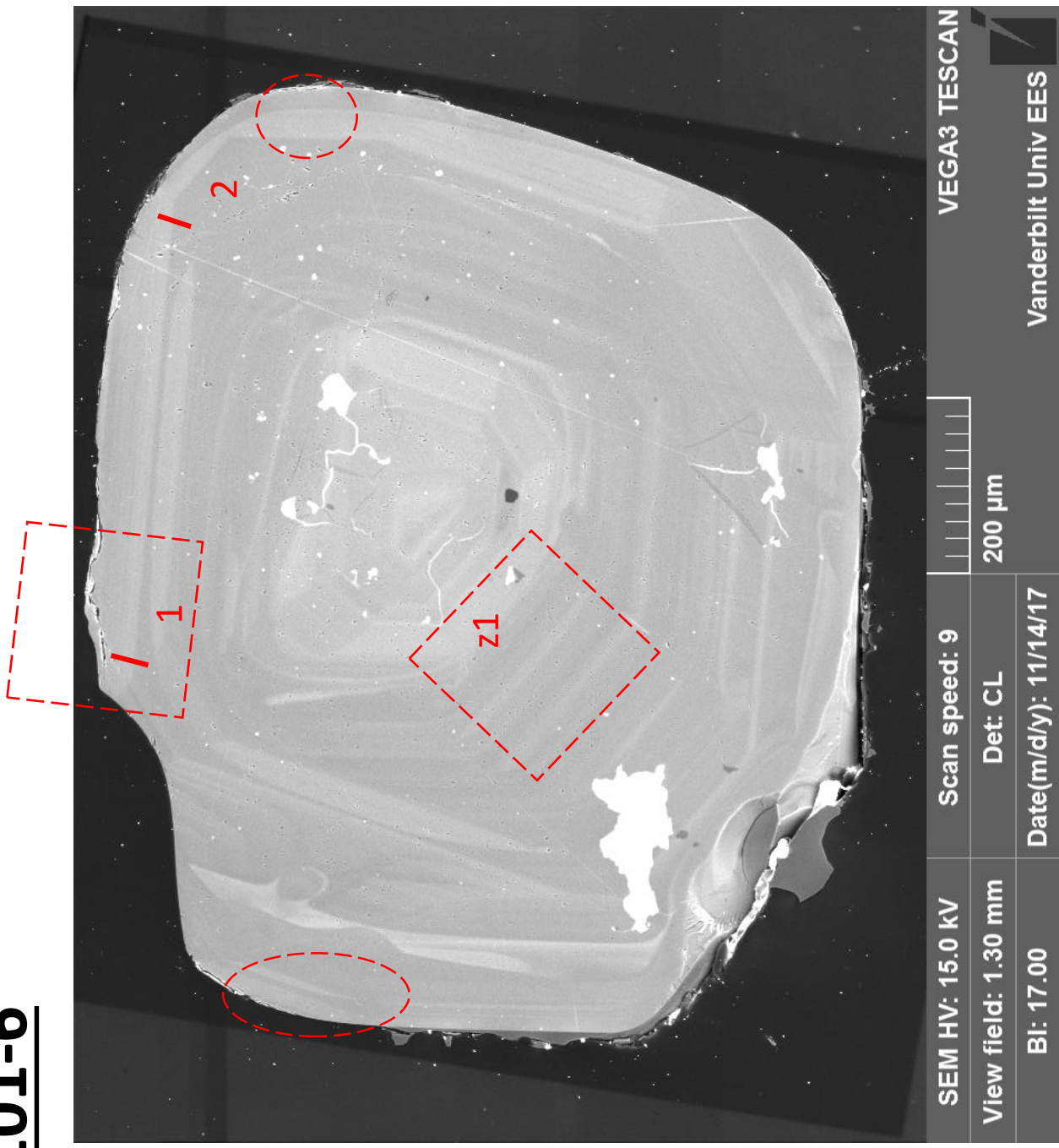
BIEI-3-101-4



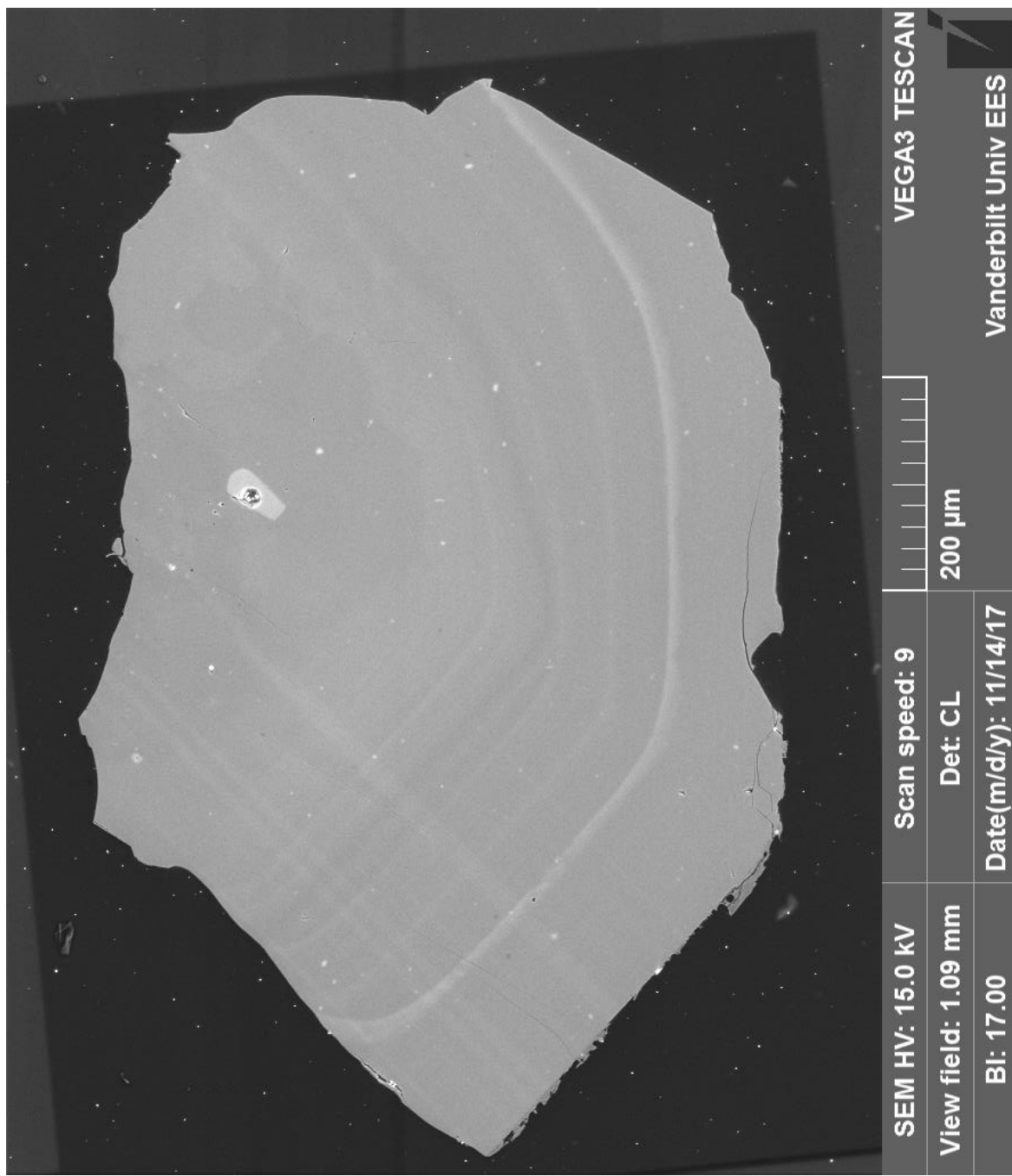
BIEI-3-101-5

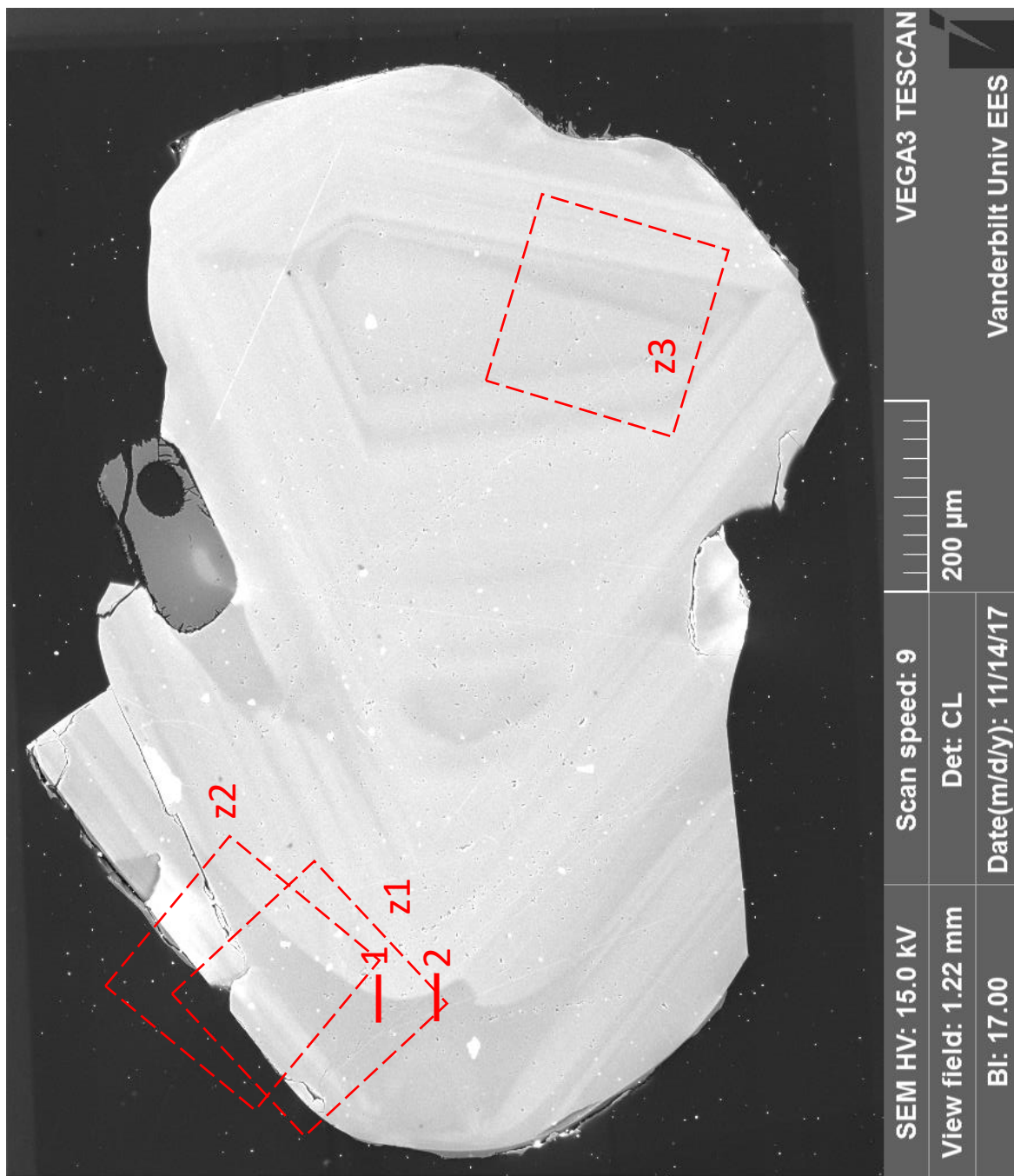


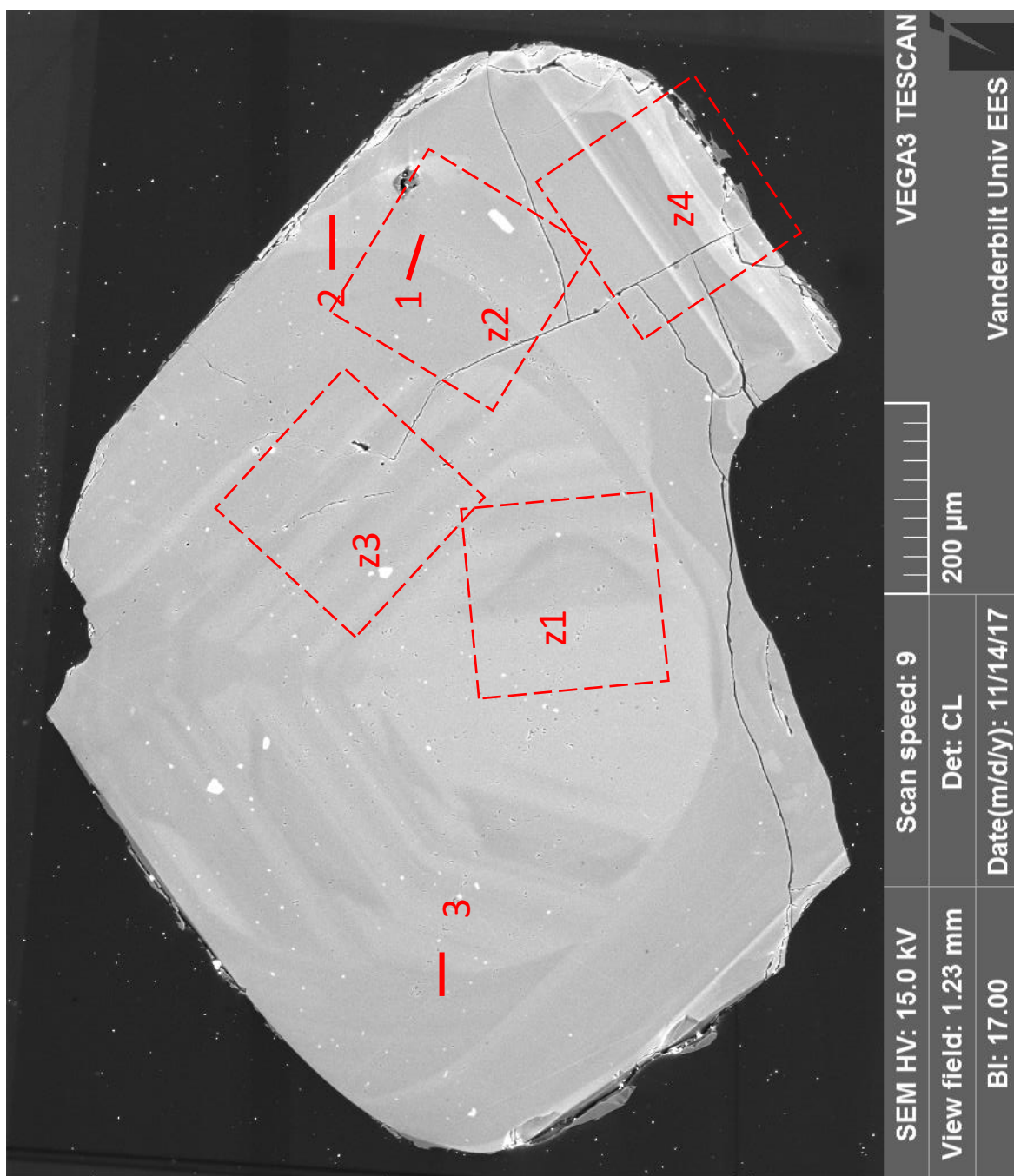
BIEI-3-101-6



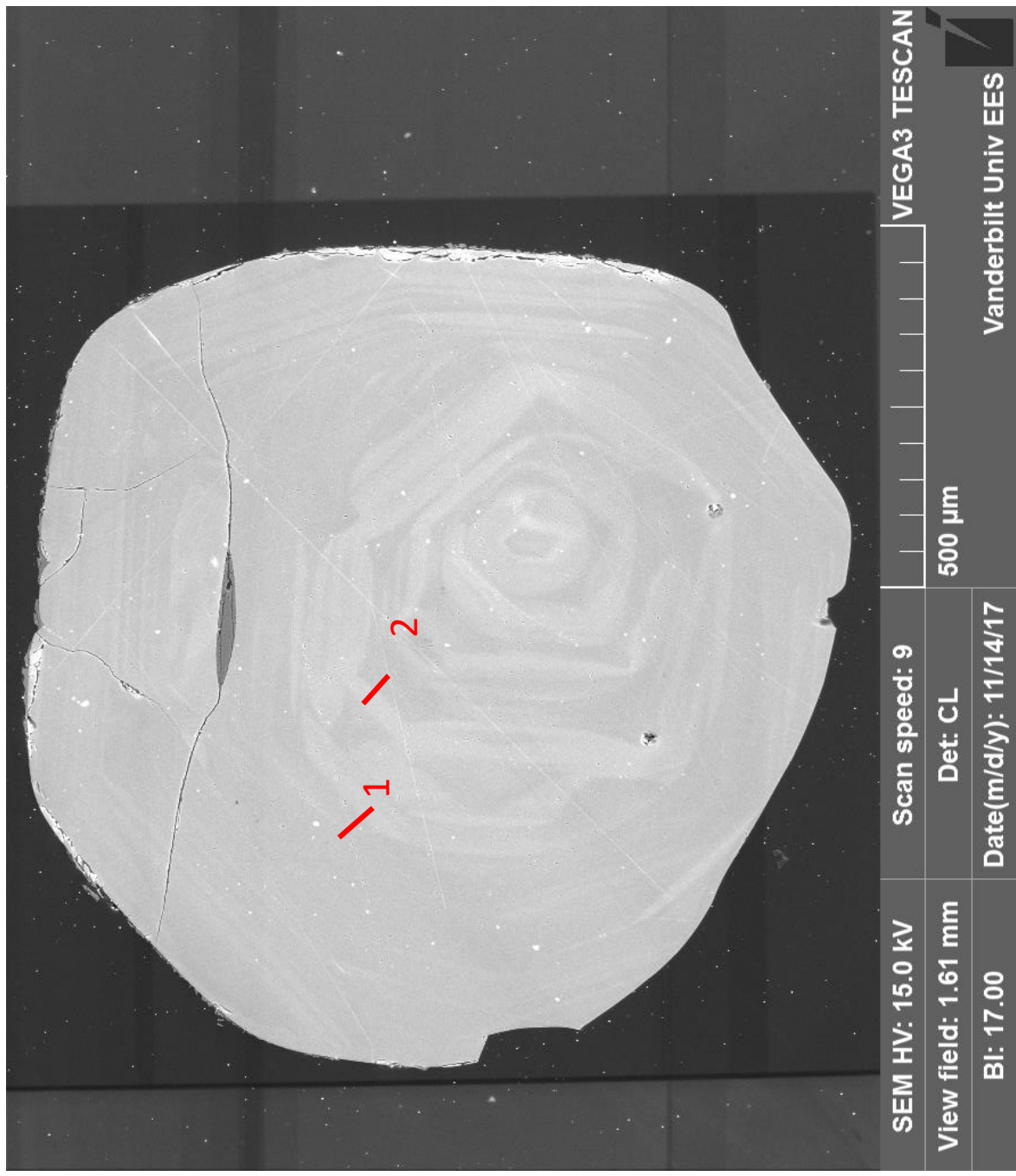
BIEI-3-101-8





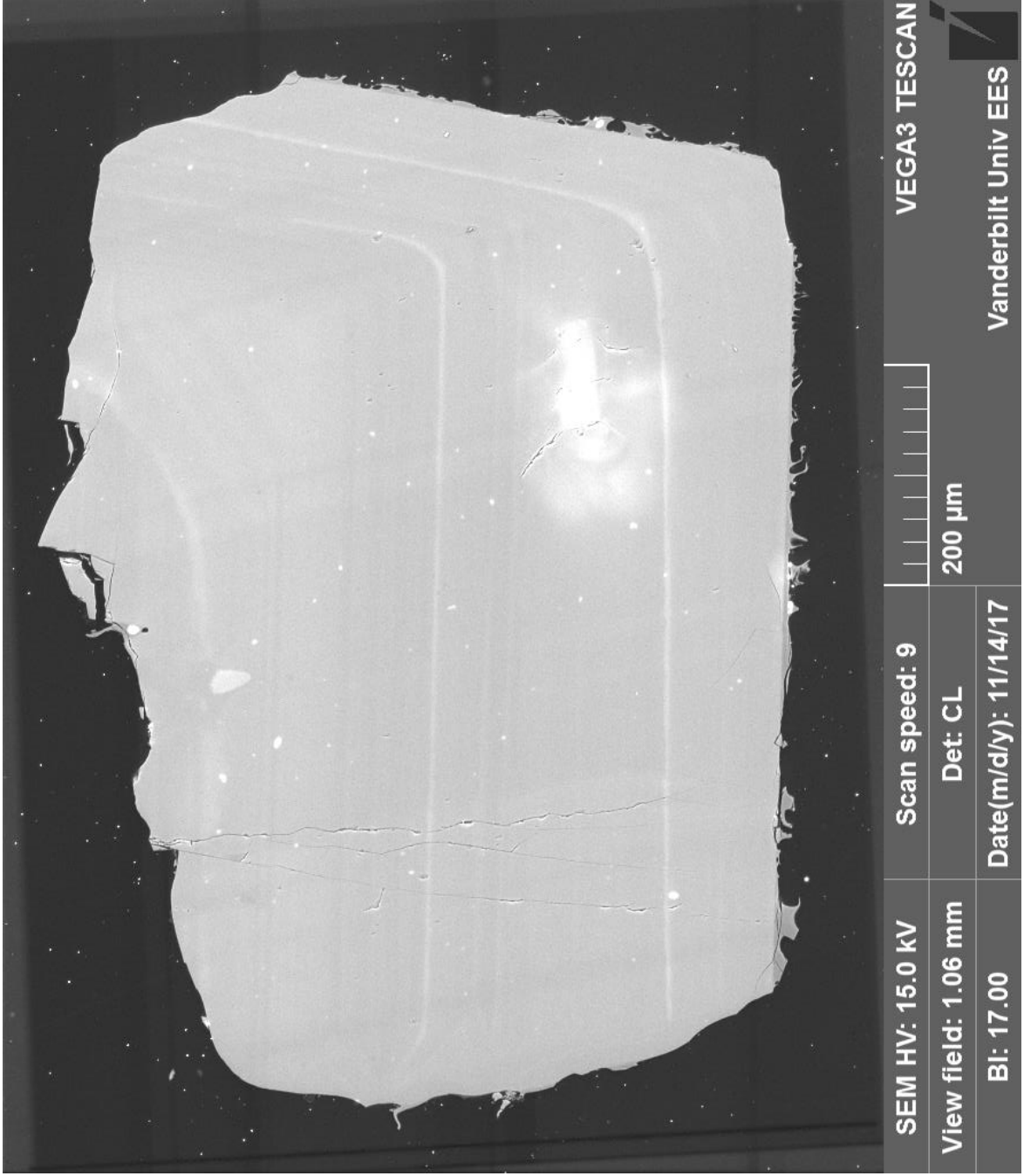


BIEI-3-101-11

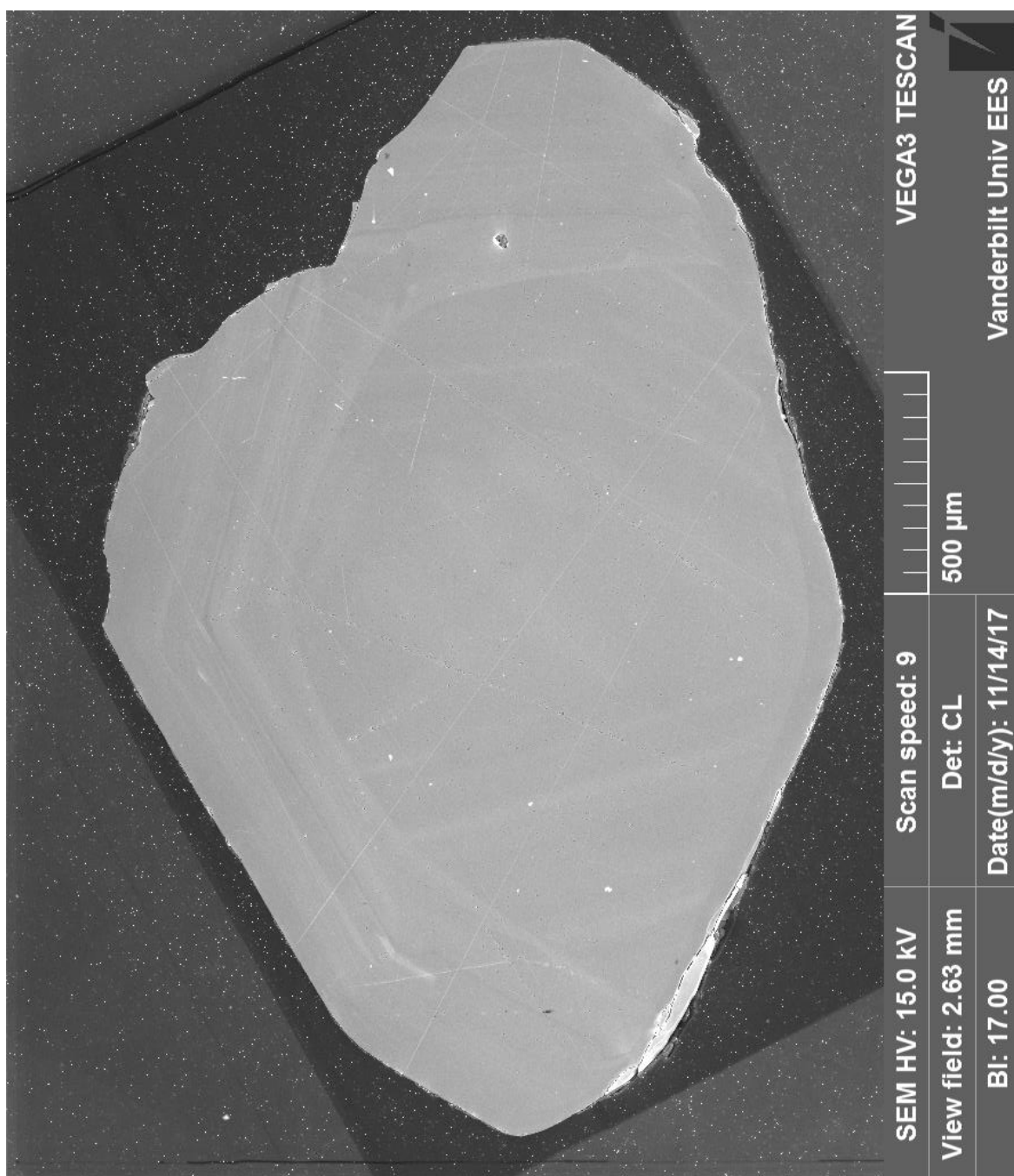


SEM HV: 15.0 kV	Scan speed: 9	VEGA3 TESCAN
View field: 1.61 mm	Det: CL	500 μm
BI: 17.00	Date(m/d/y): 11/14/17	Vanderbilt Univ EES

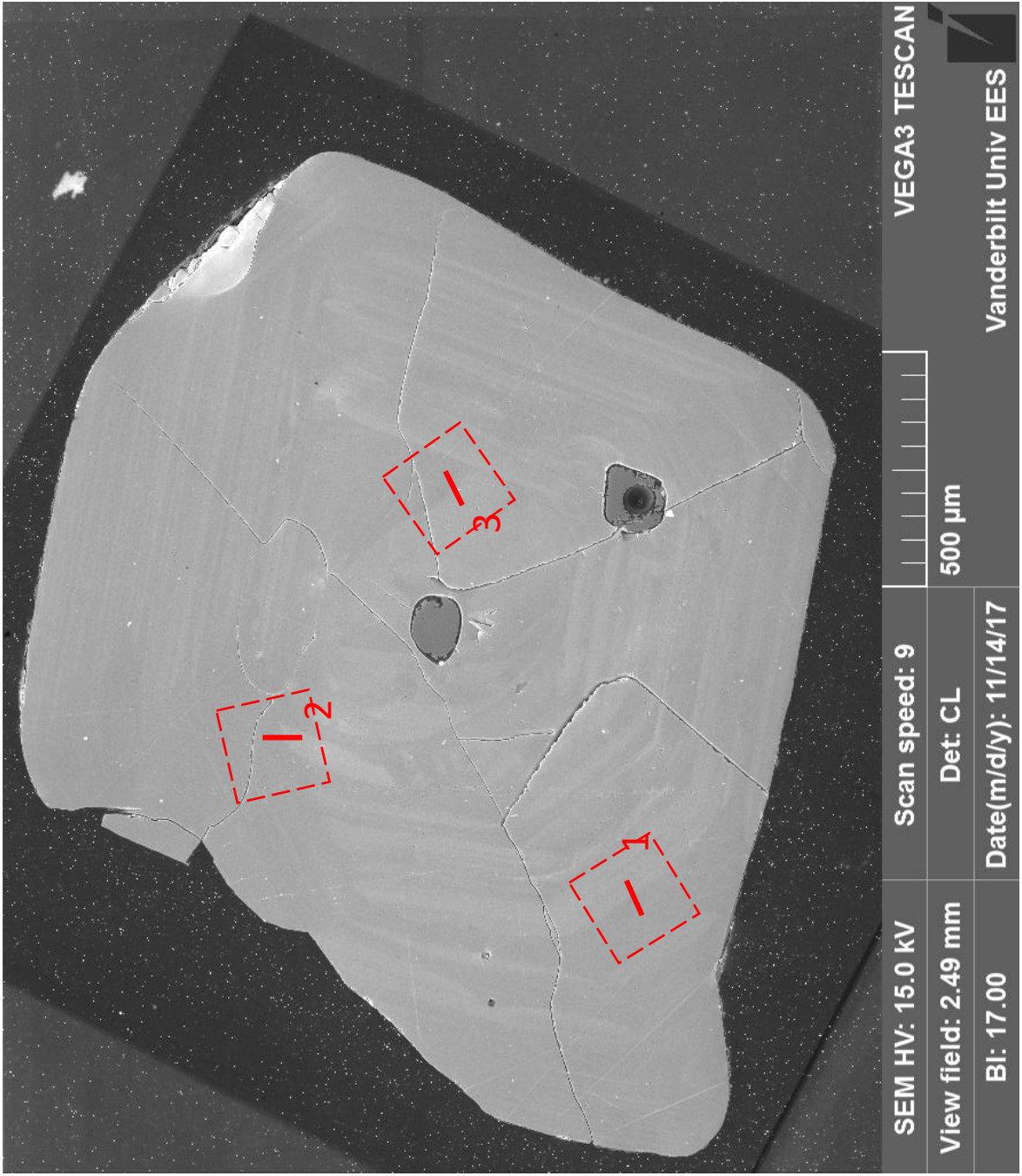
BIEI-3-101-12



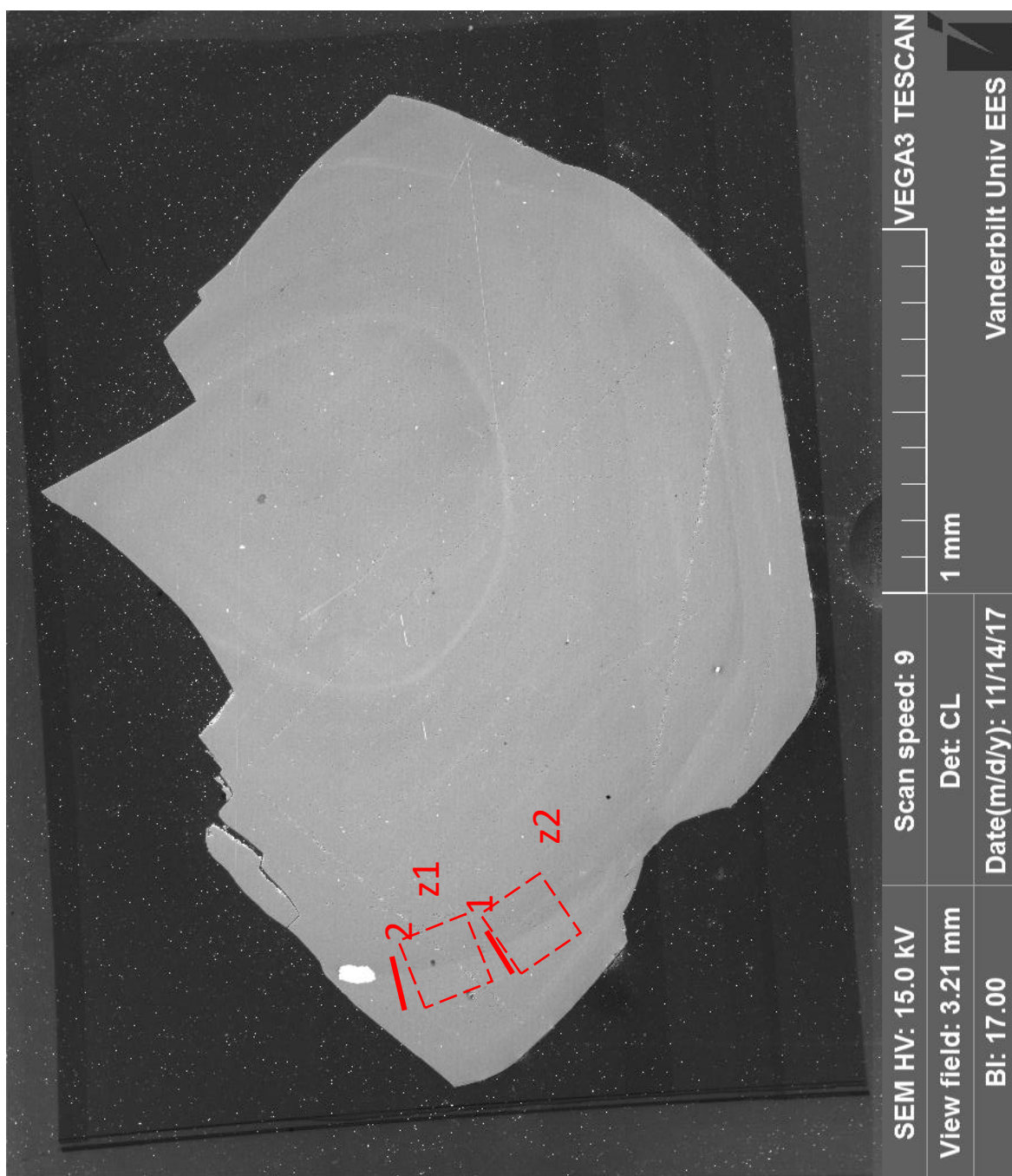
BIEI-3-101-14



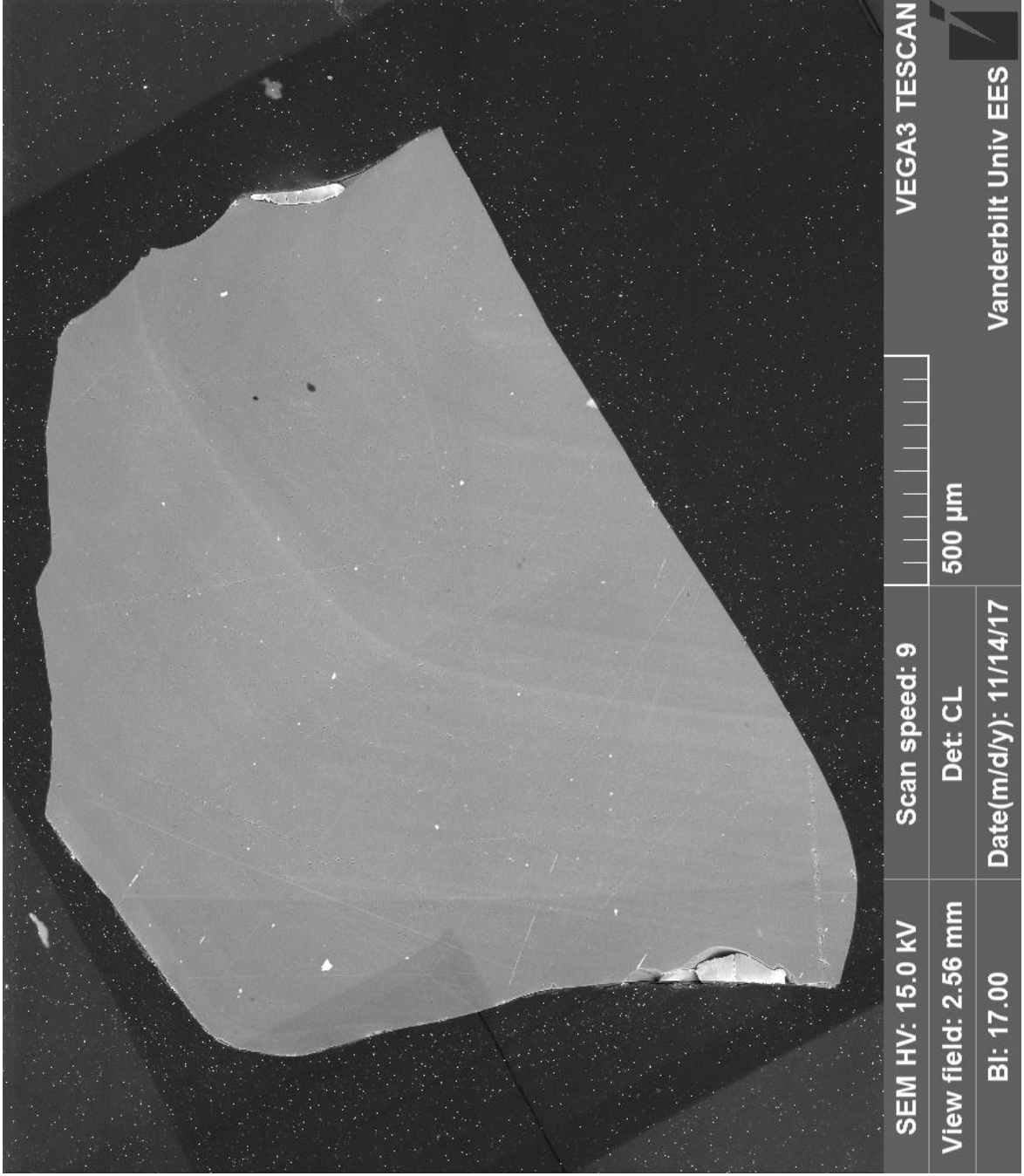
BIEI-3-101-15



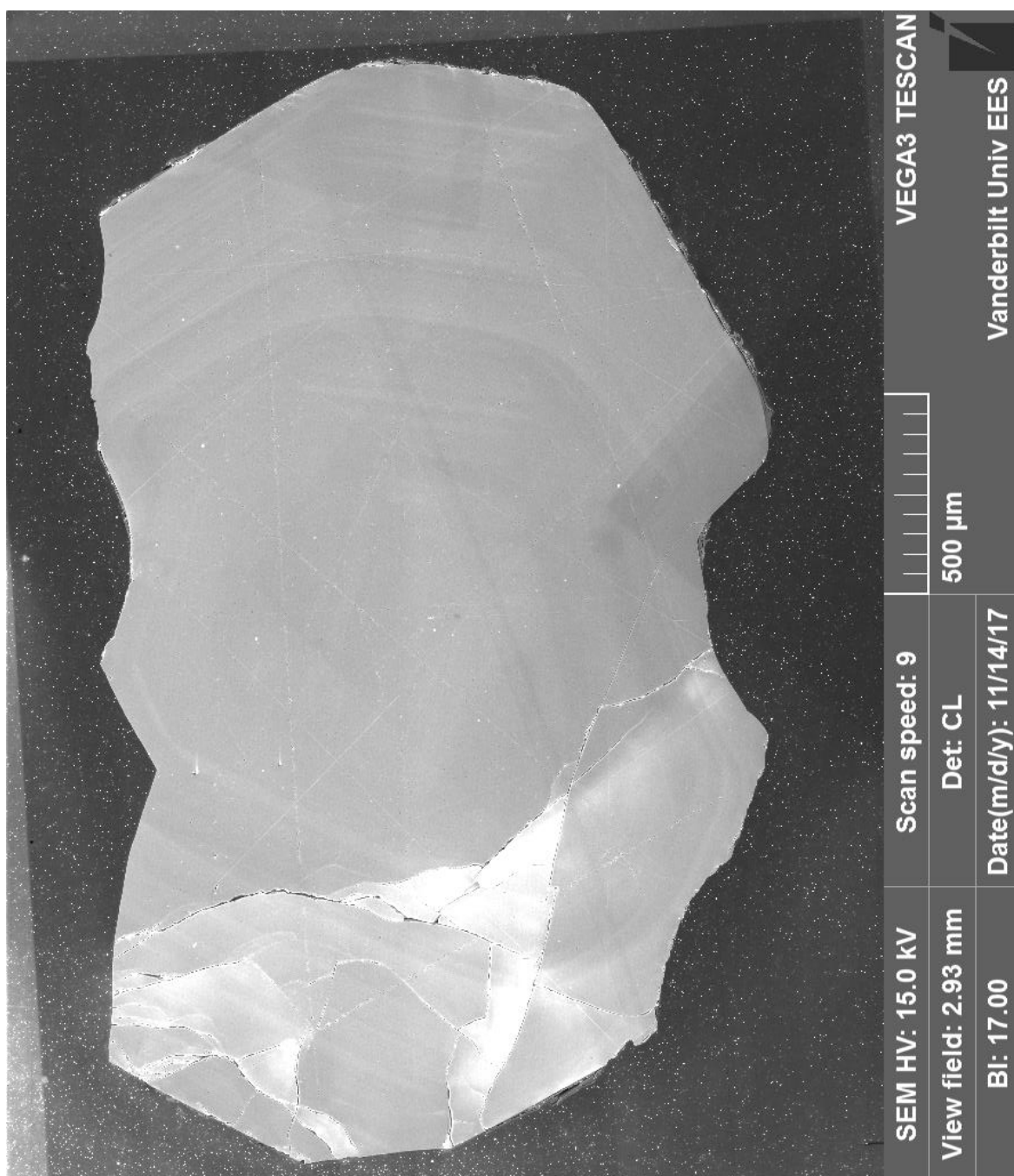
BIEI-3-101-16



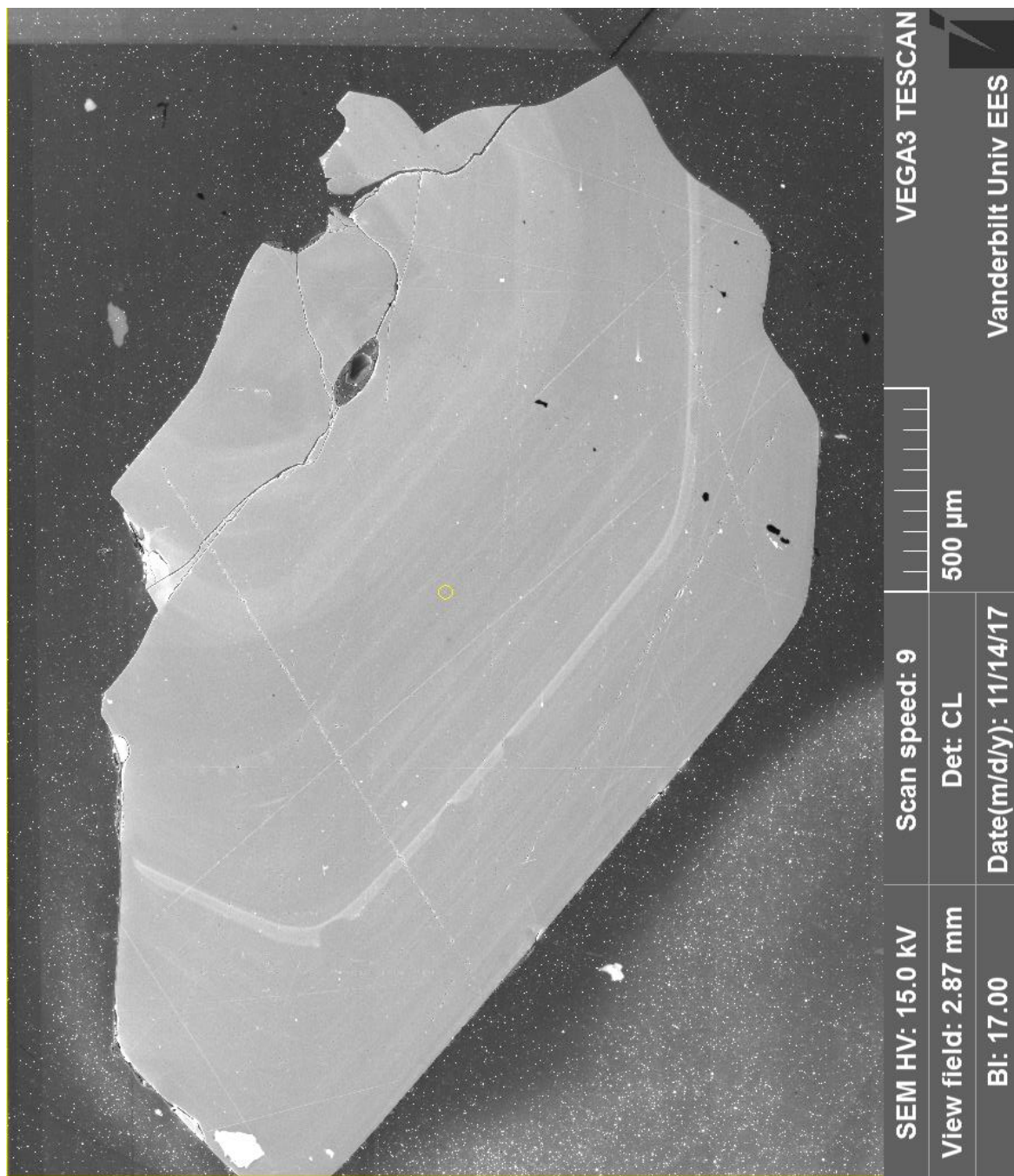
BIEI-3-101-17



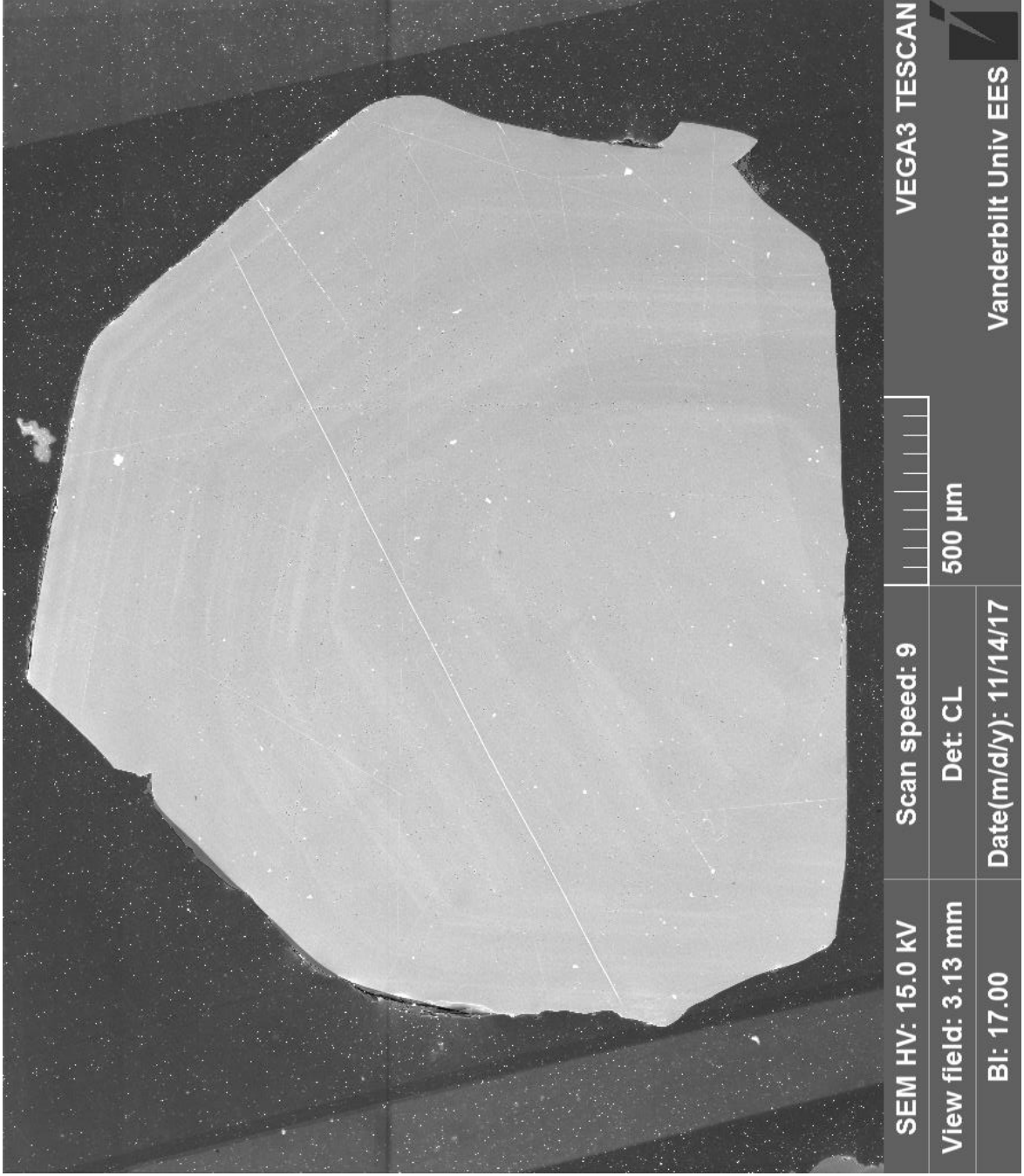
BIEI-3-101-19



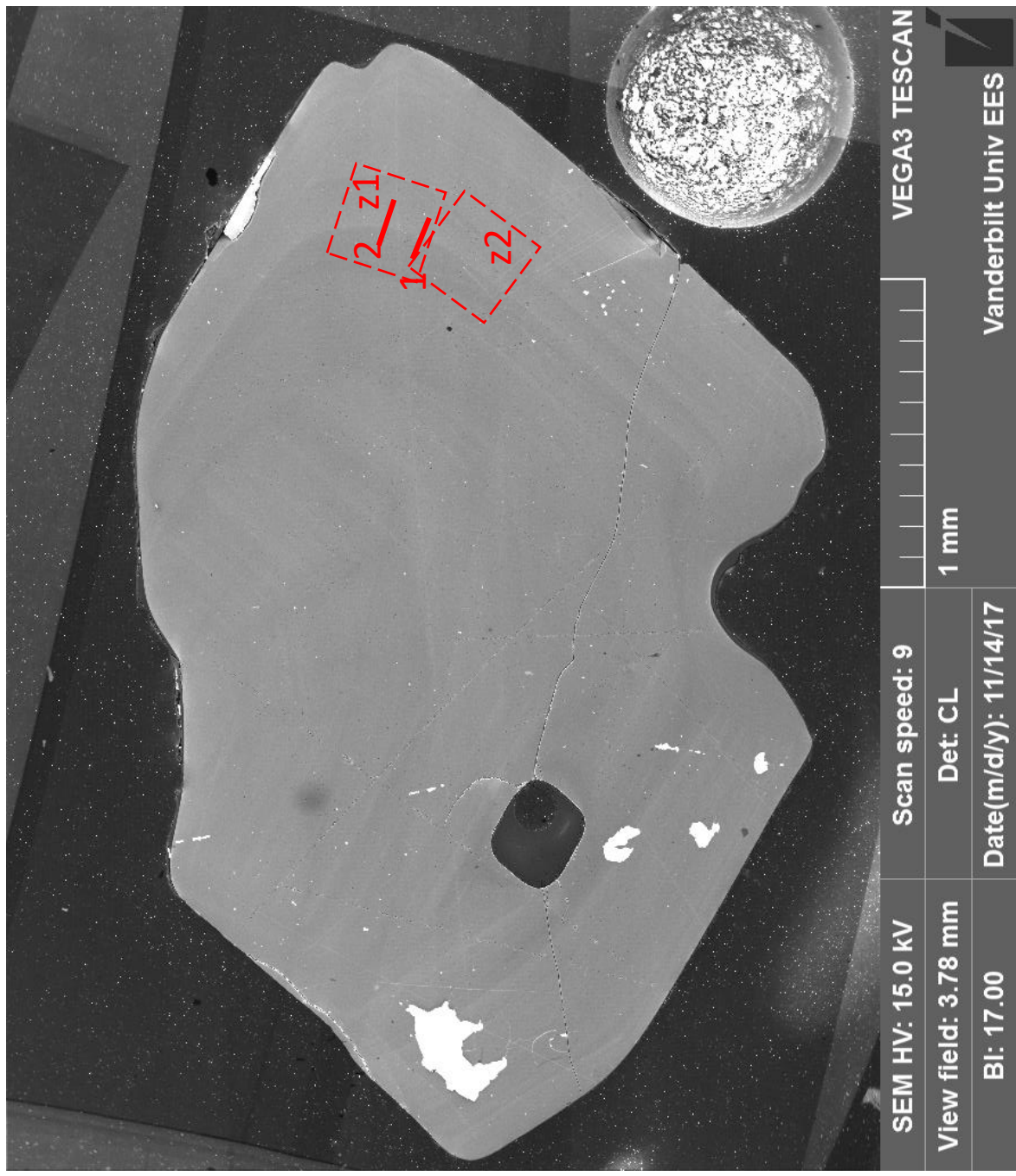
BIEI-3-101-20



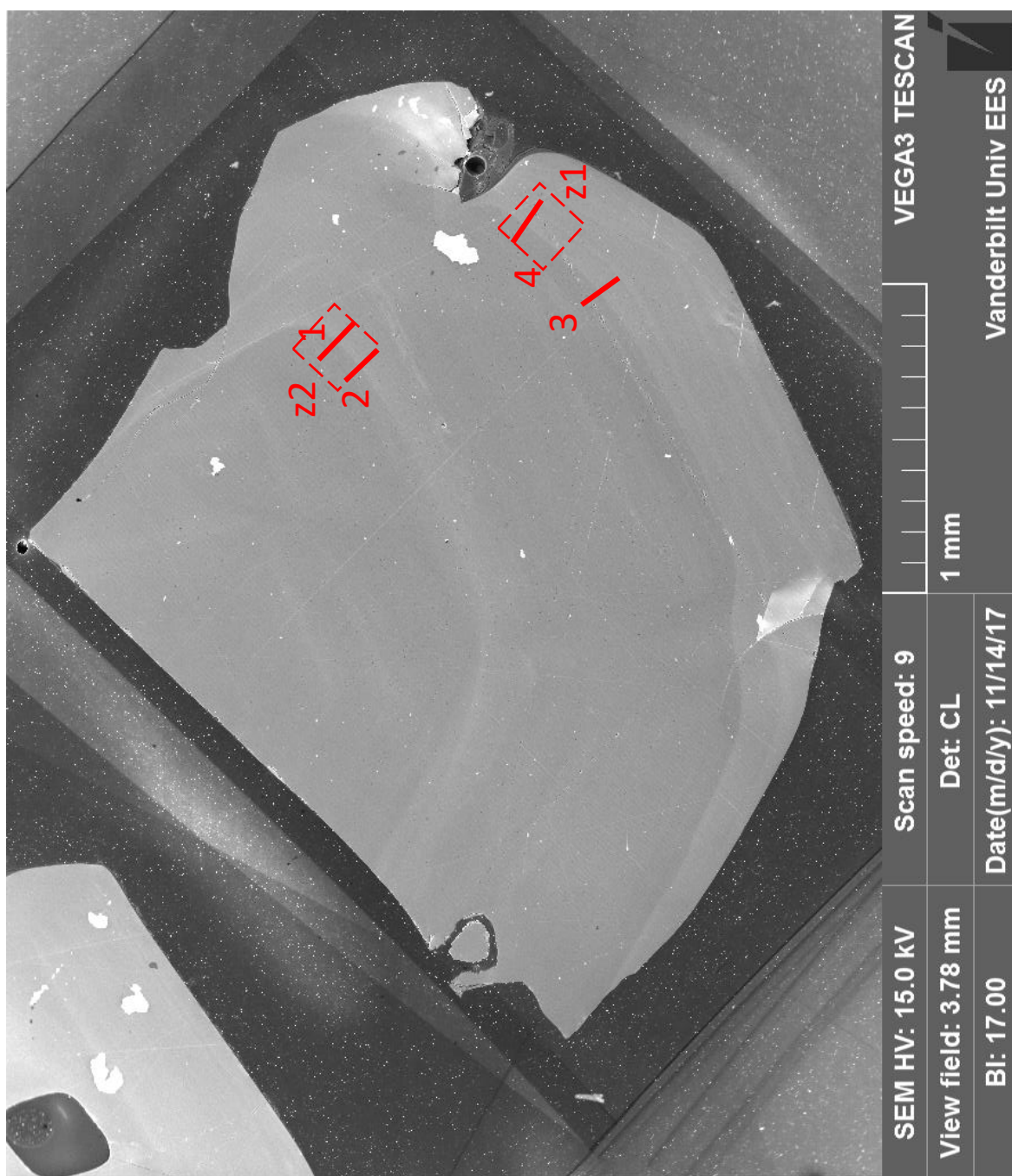
BIEI-3-101-22



BIEI-3-101-23

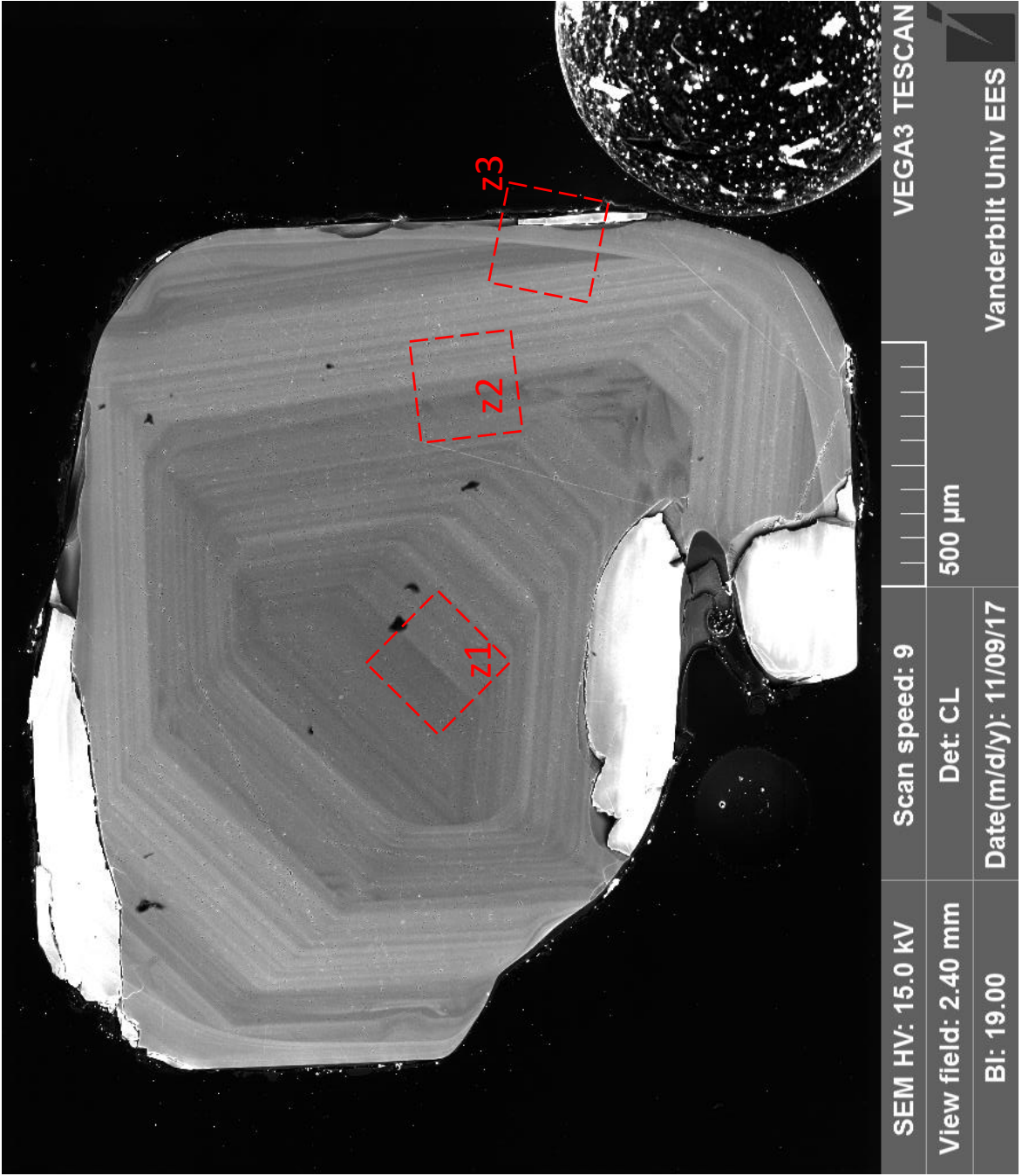


BIEI-3-101-24

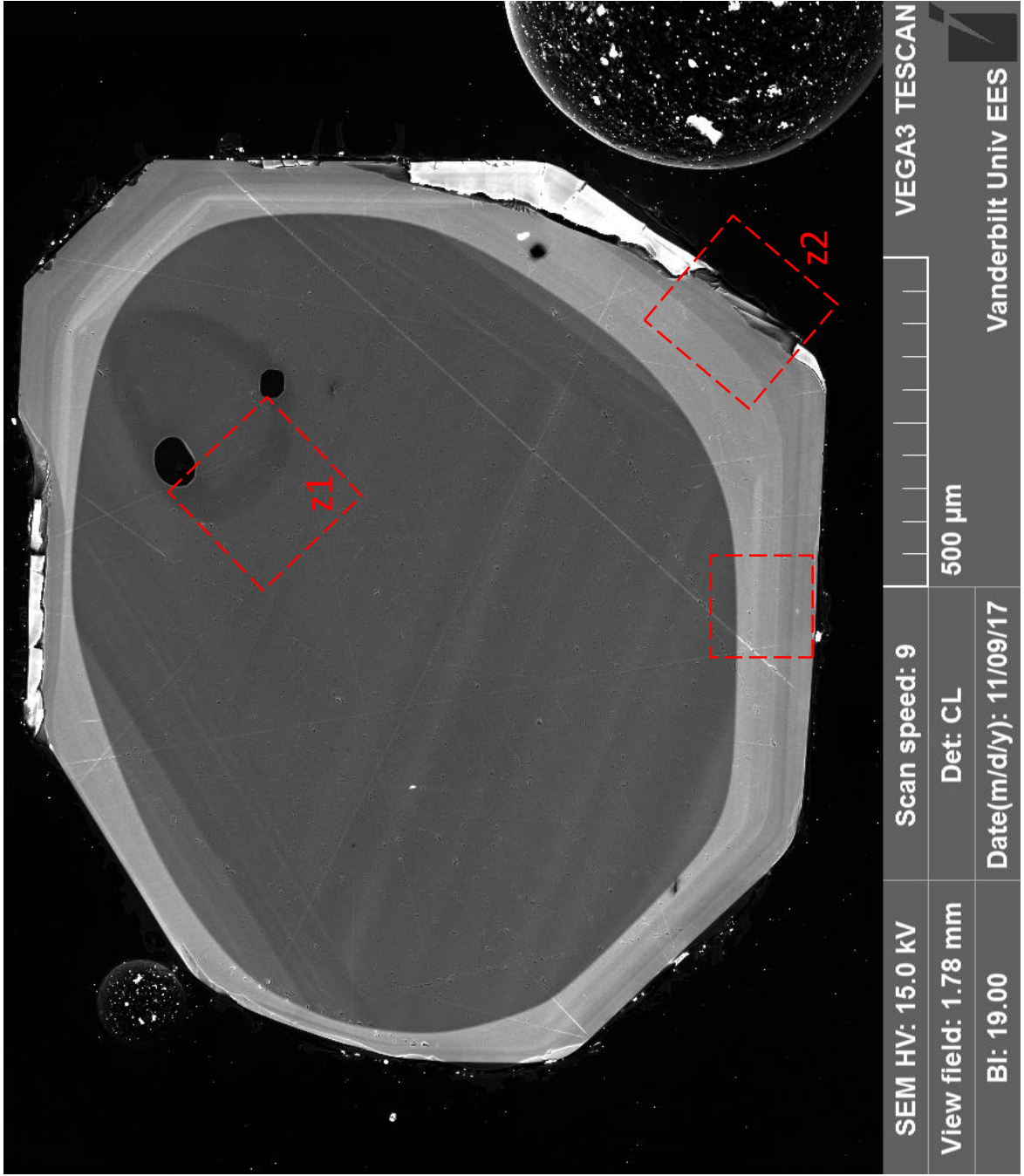


TOKA-3-301

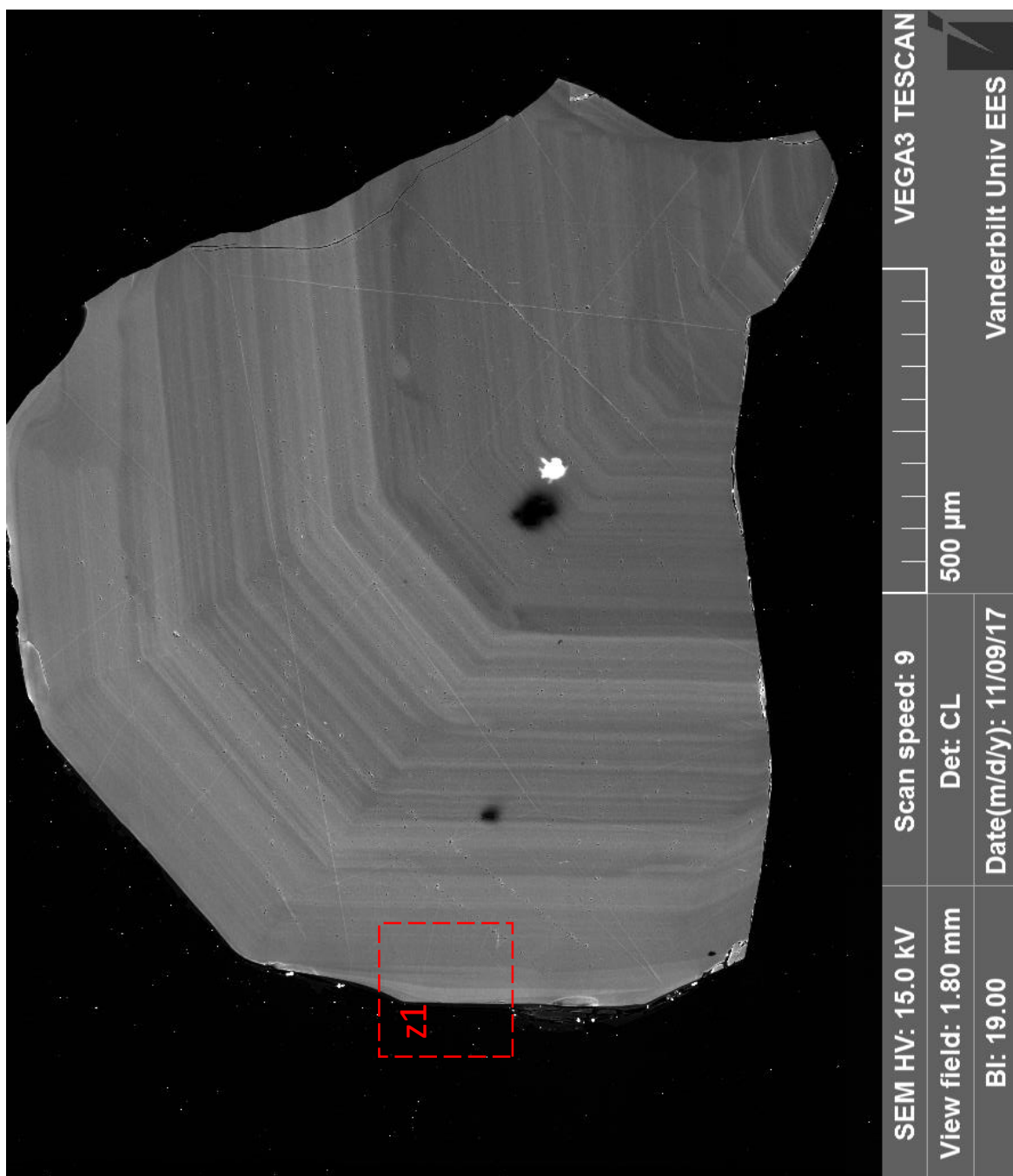
TOKA-3-301-1



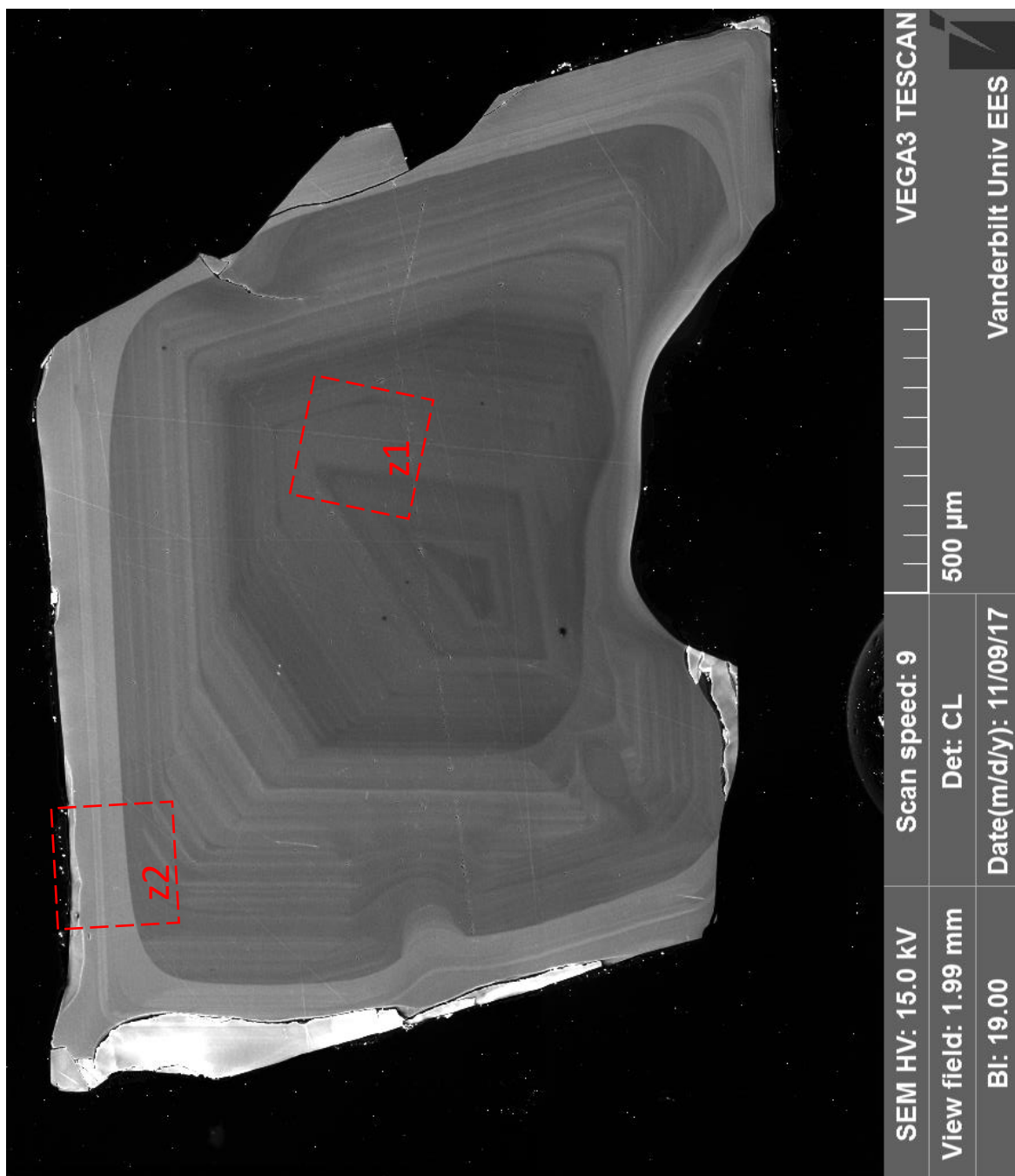
TOKA-3-301-2

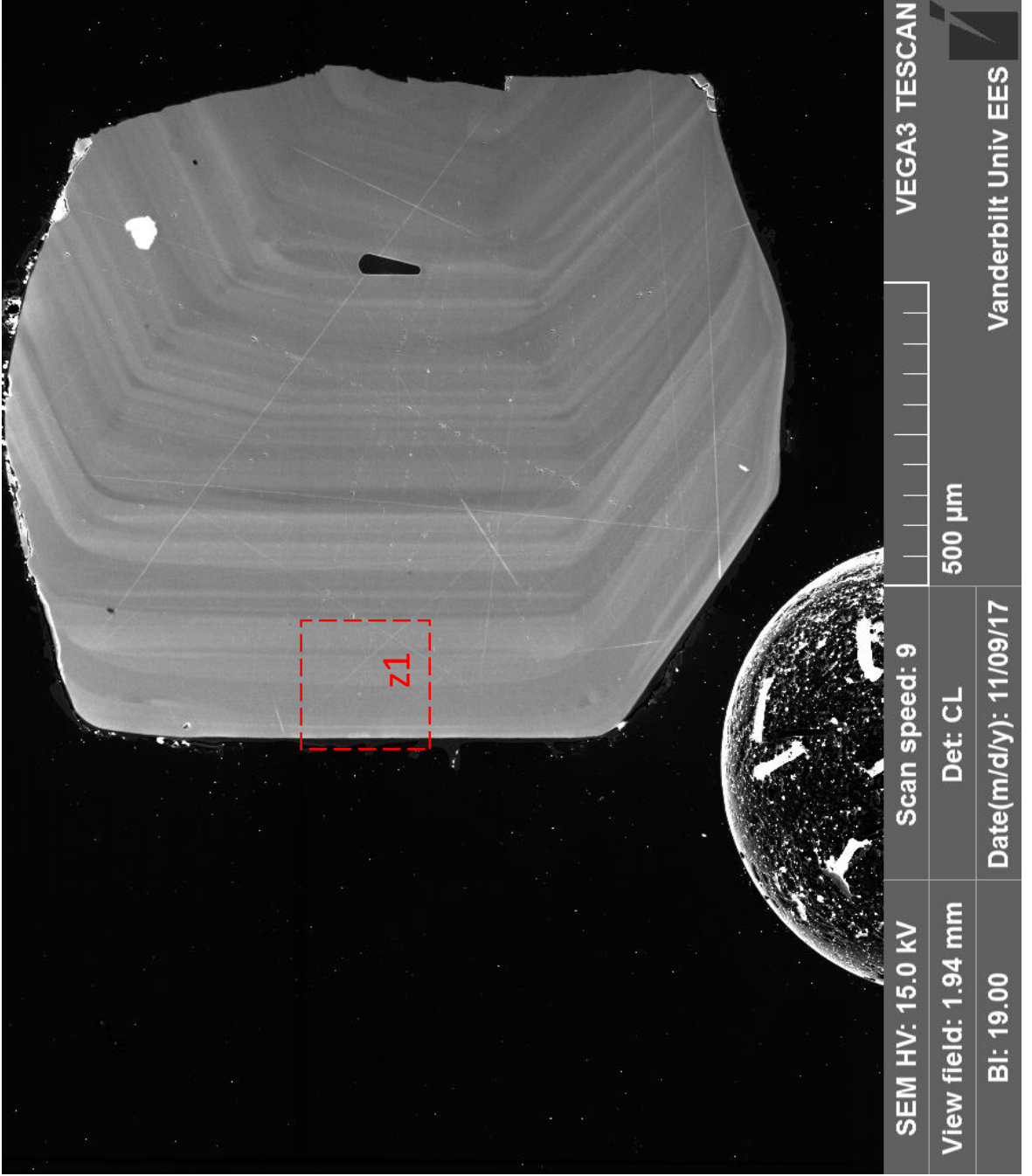


TOKA-3-301-3

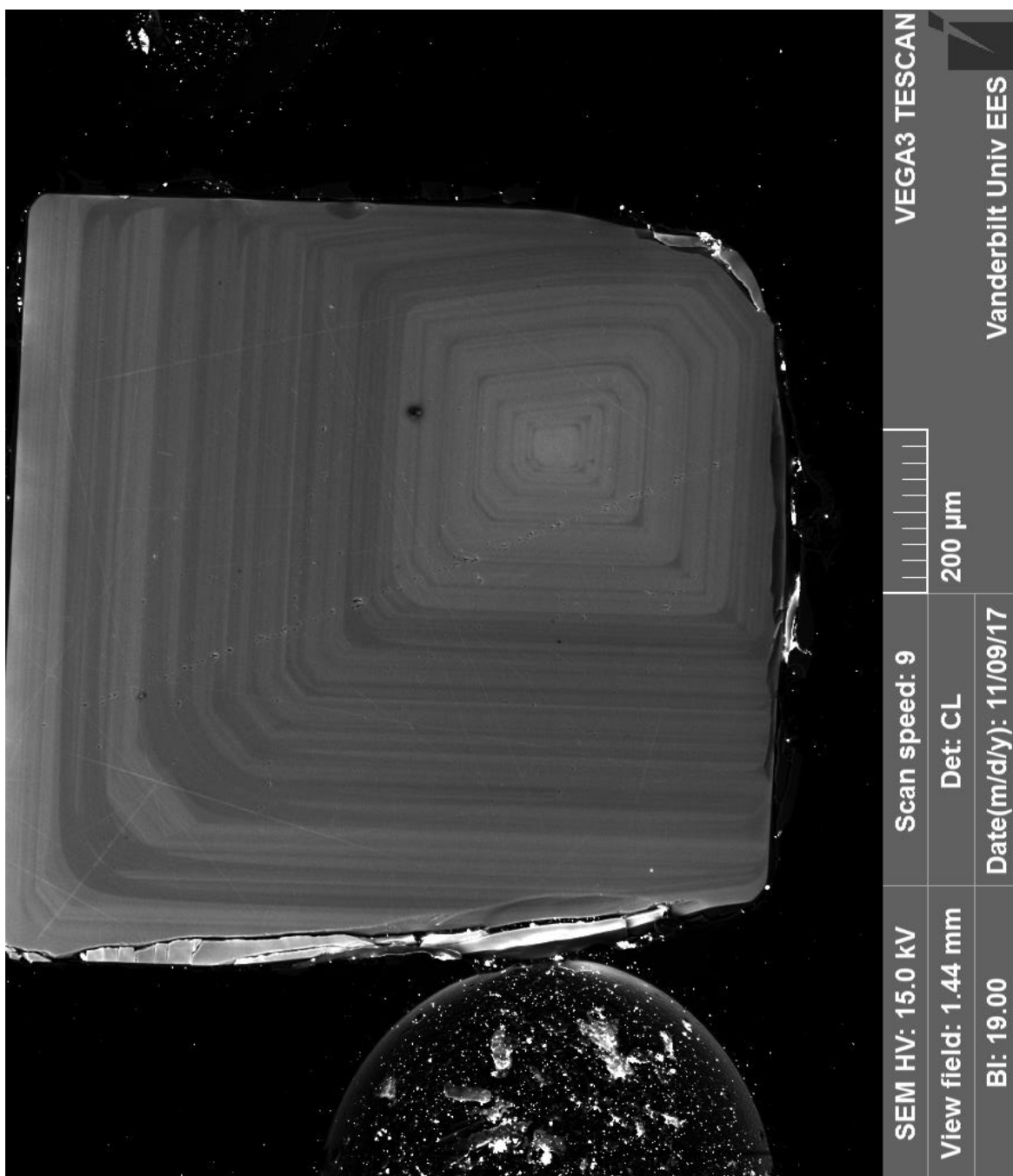


TOKA-3-301-4

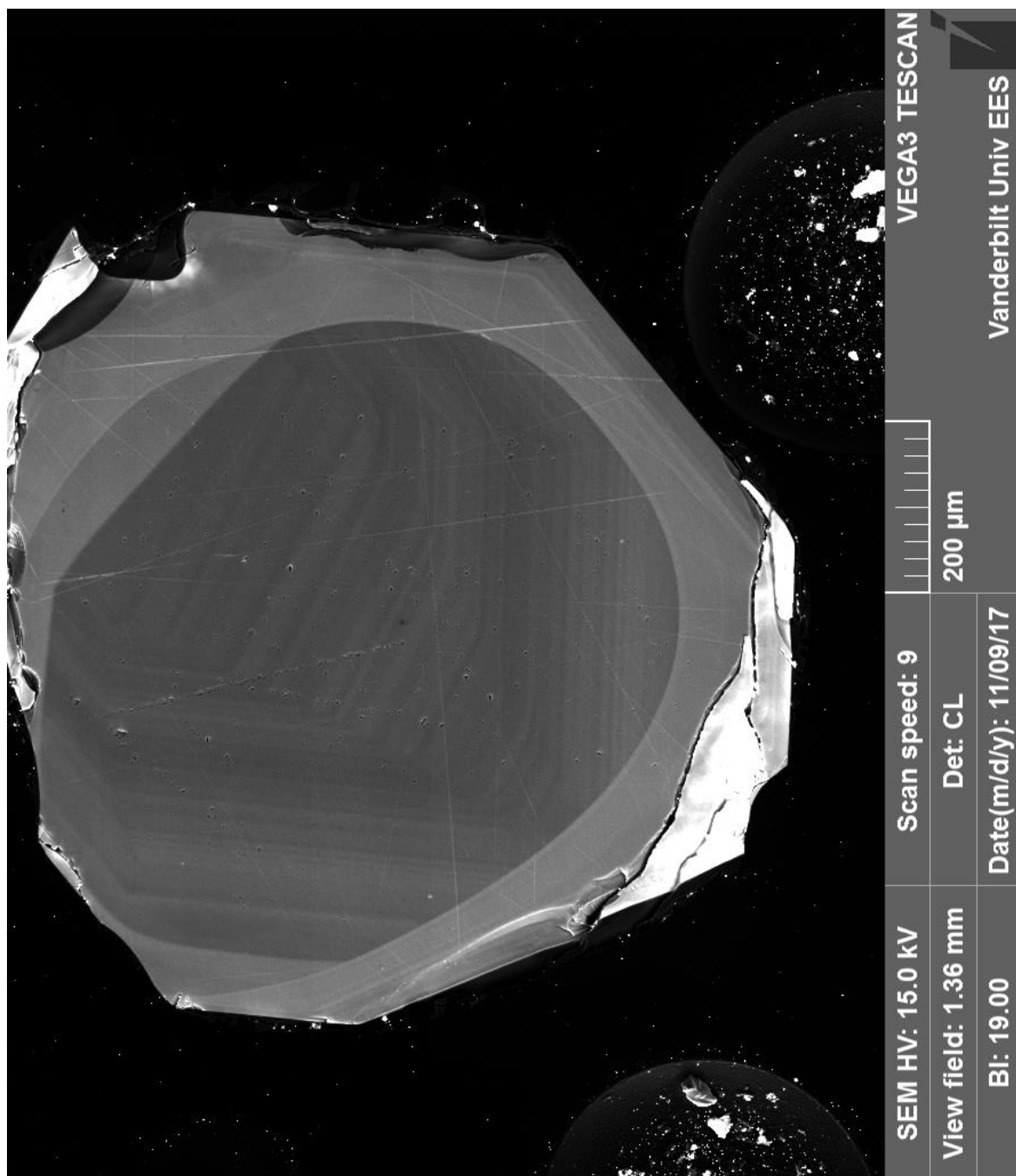




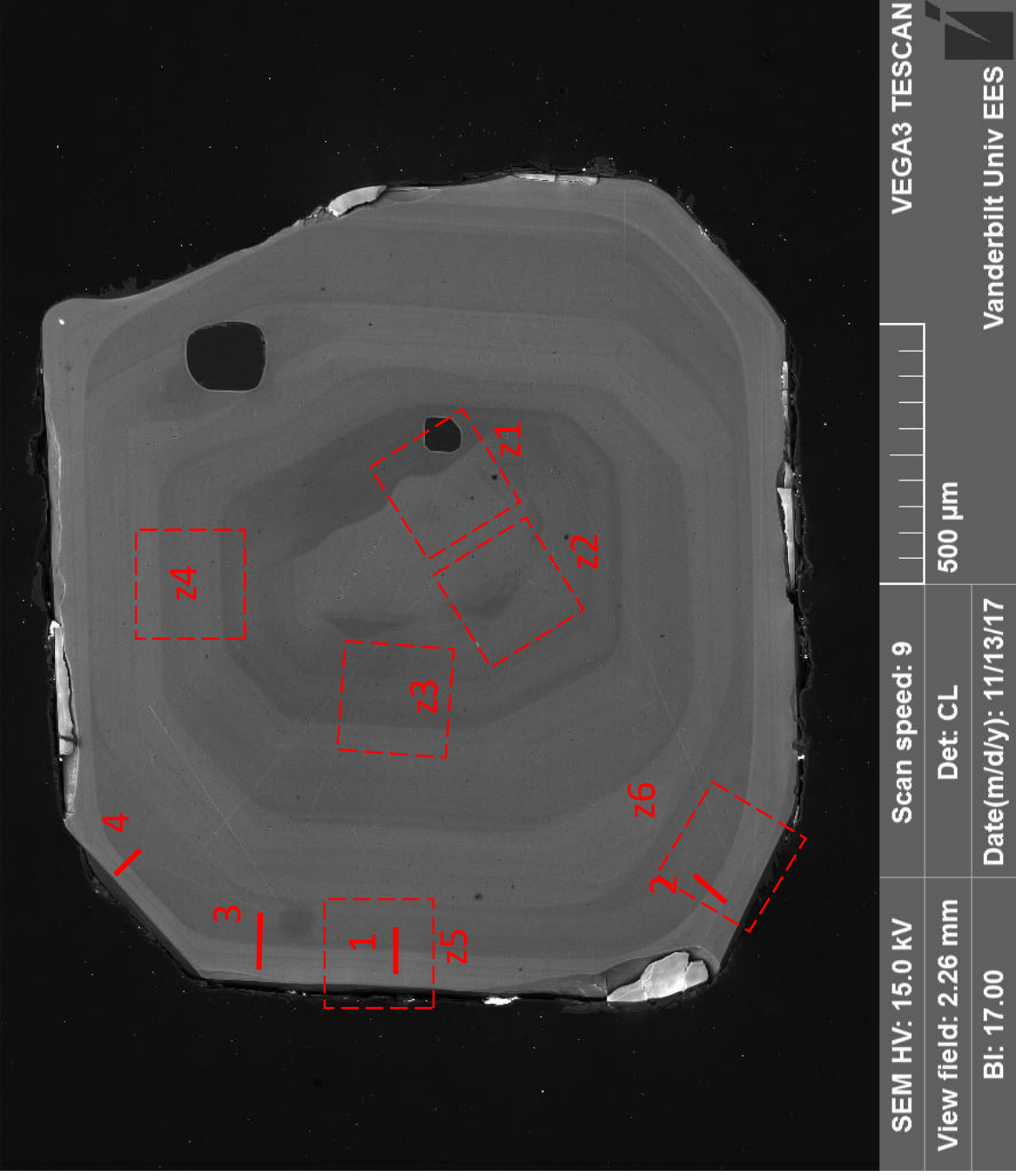
TOKA-3-301-6



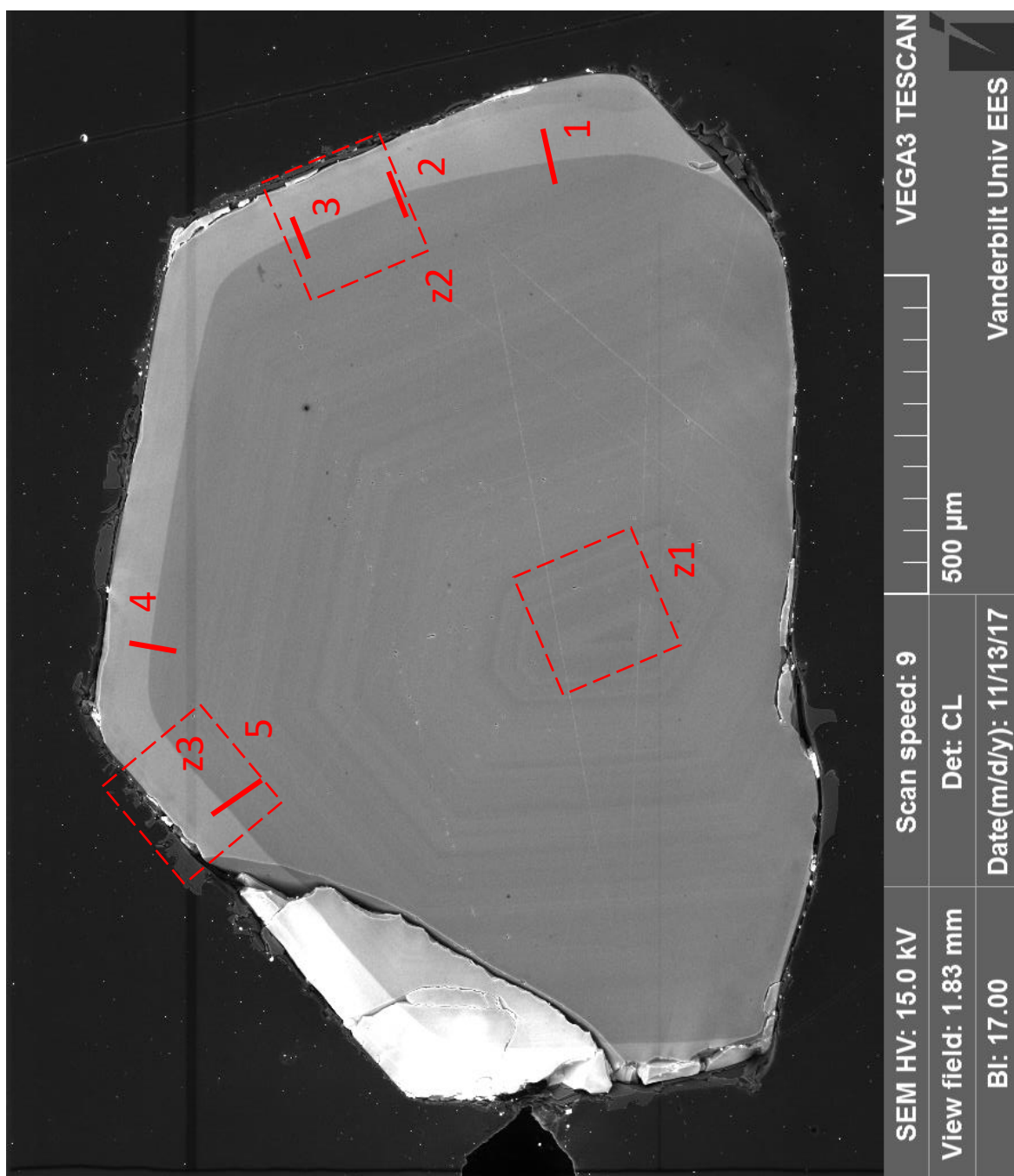
TOKA-3-301-8



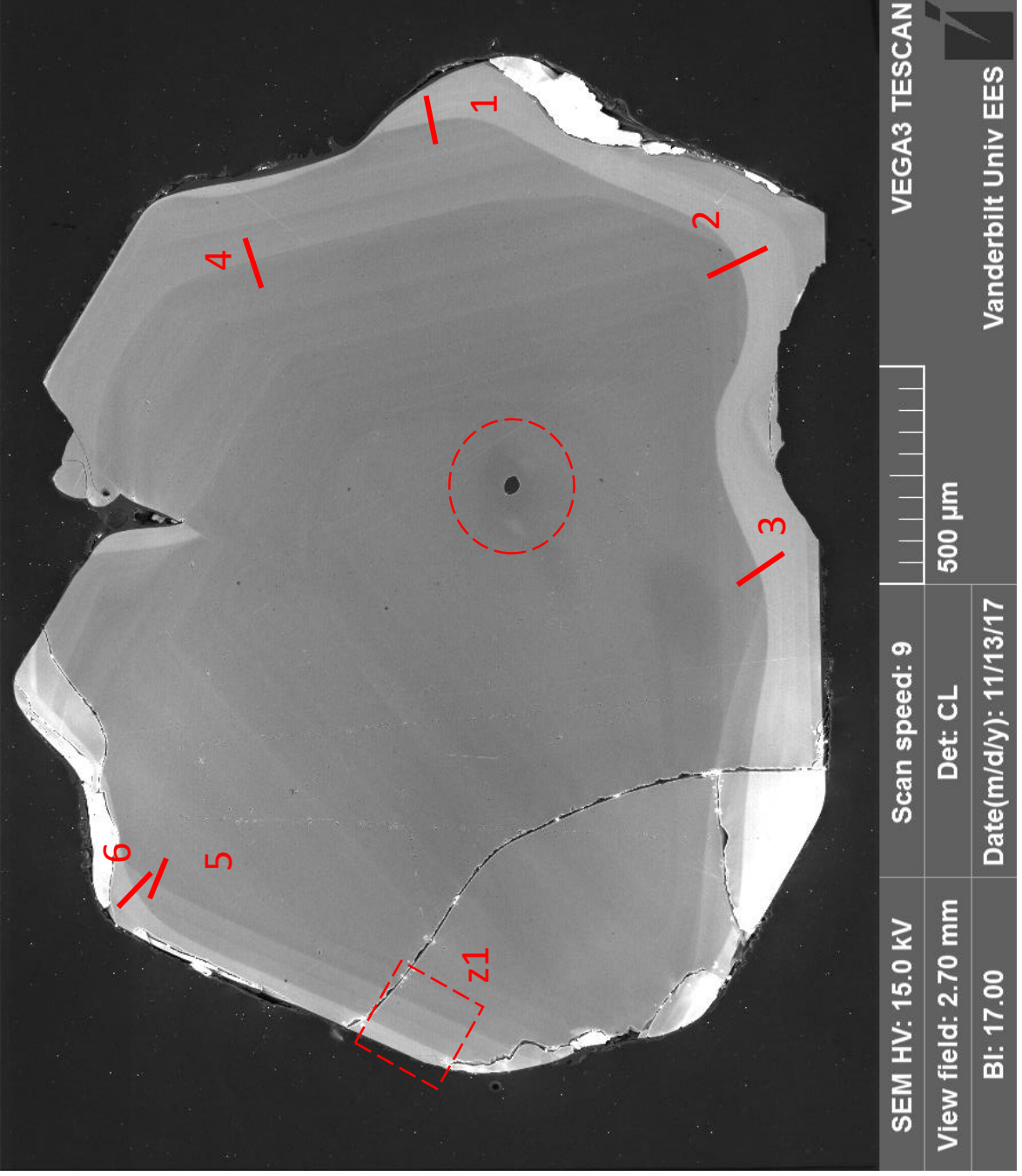
TOKA-3-301-10



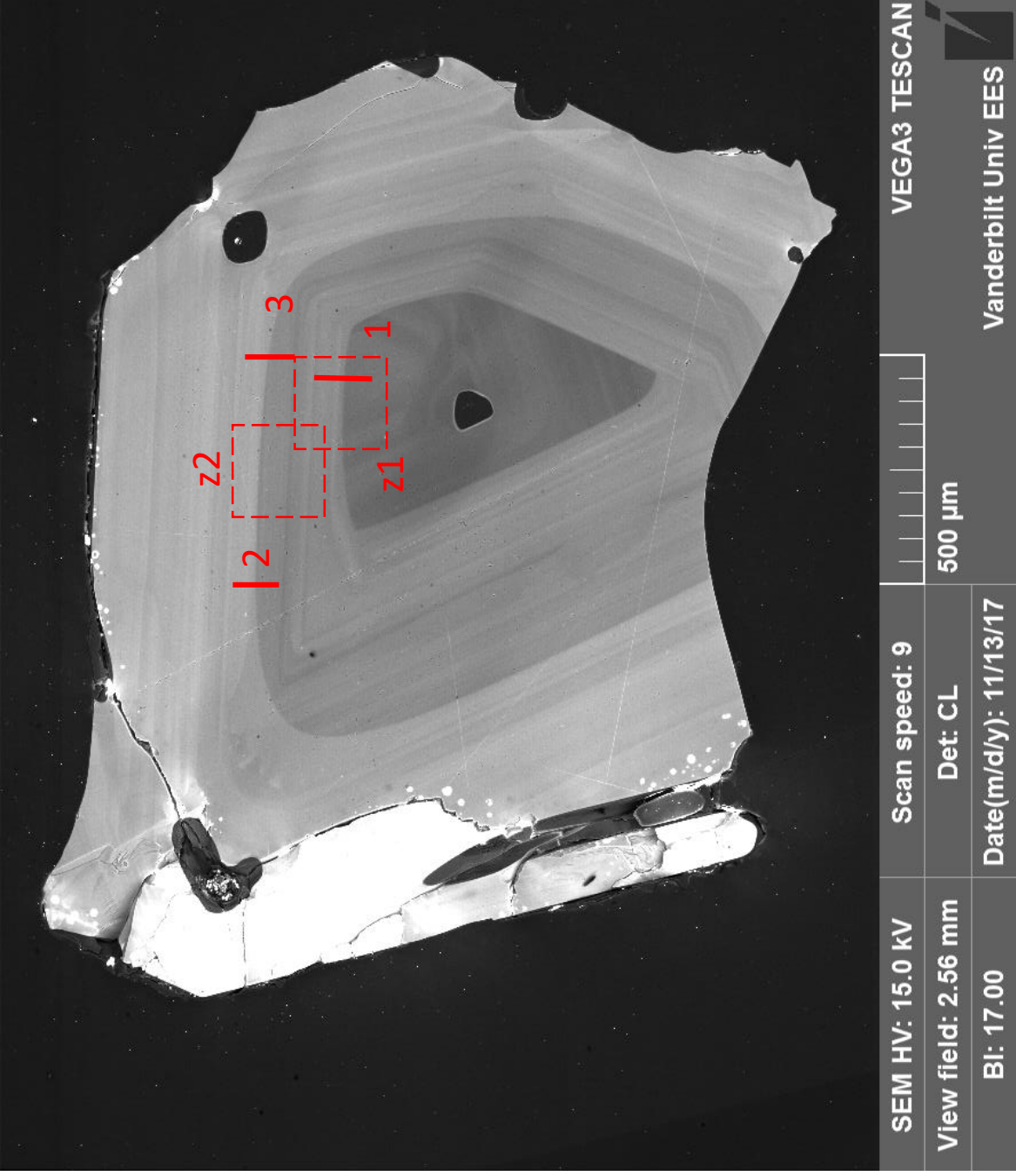
TOKA-3-301-11



TOKA-3-301-12

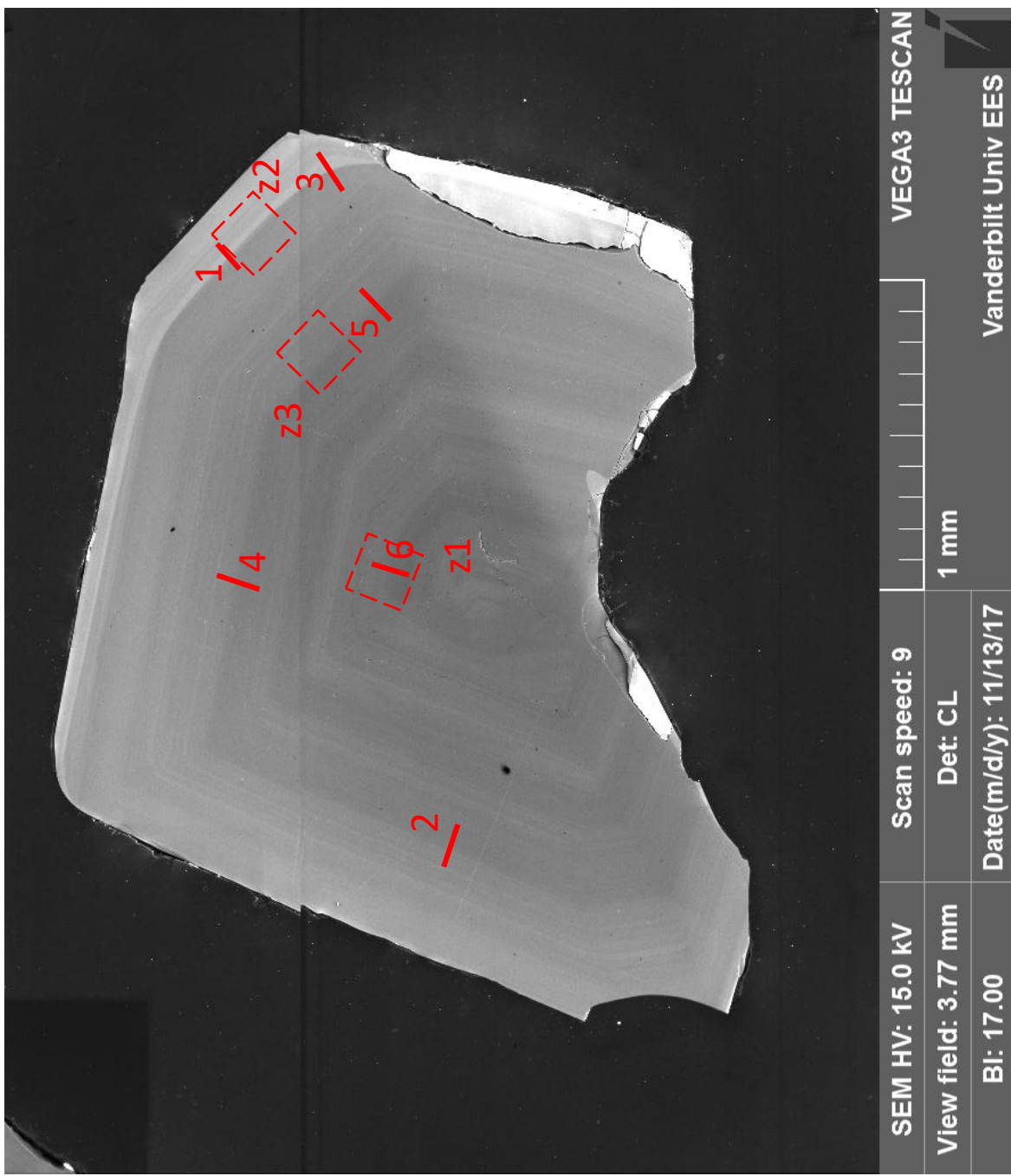


TOKA-3-301-13

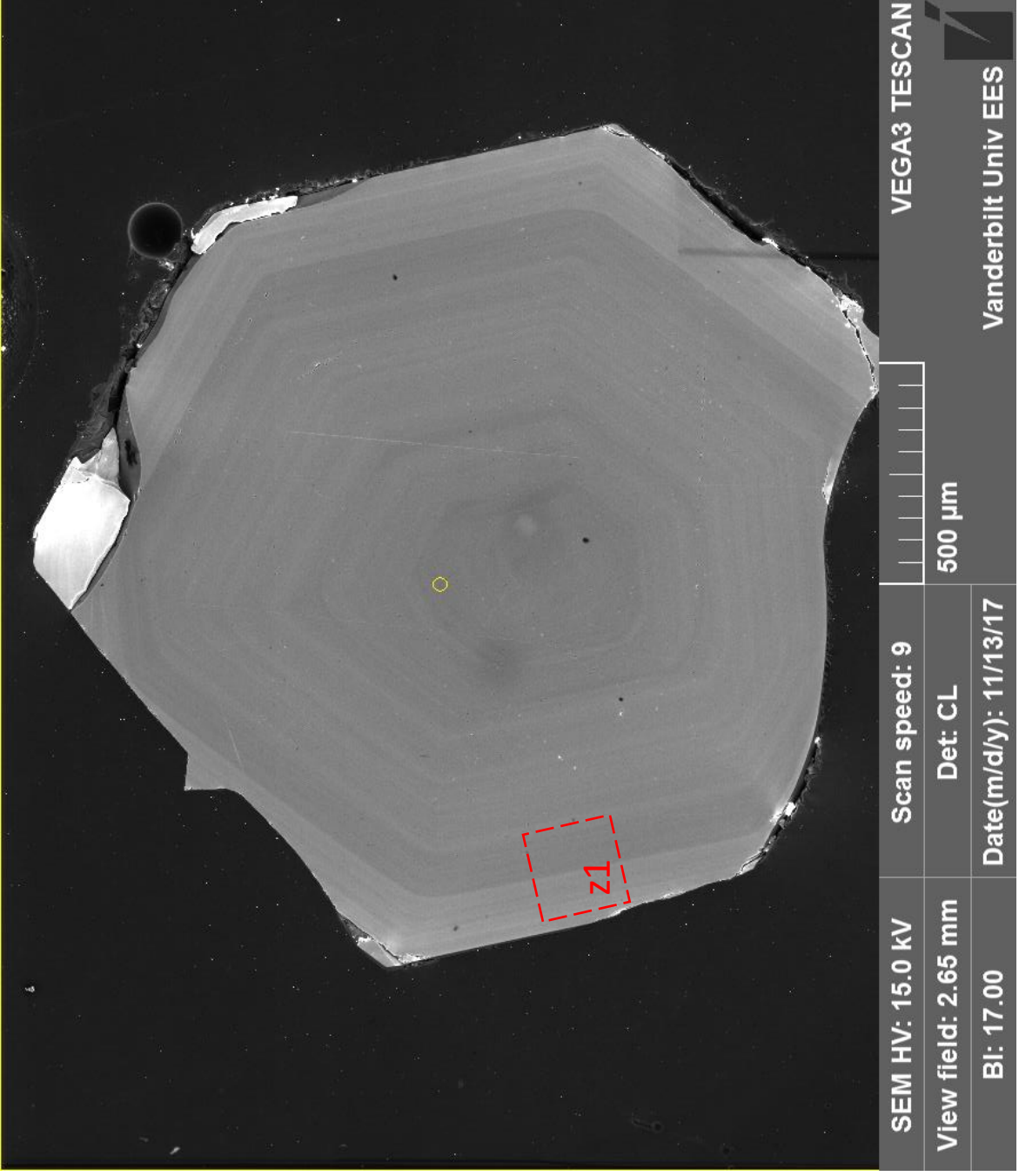


TOKA-3-301-14

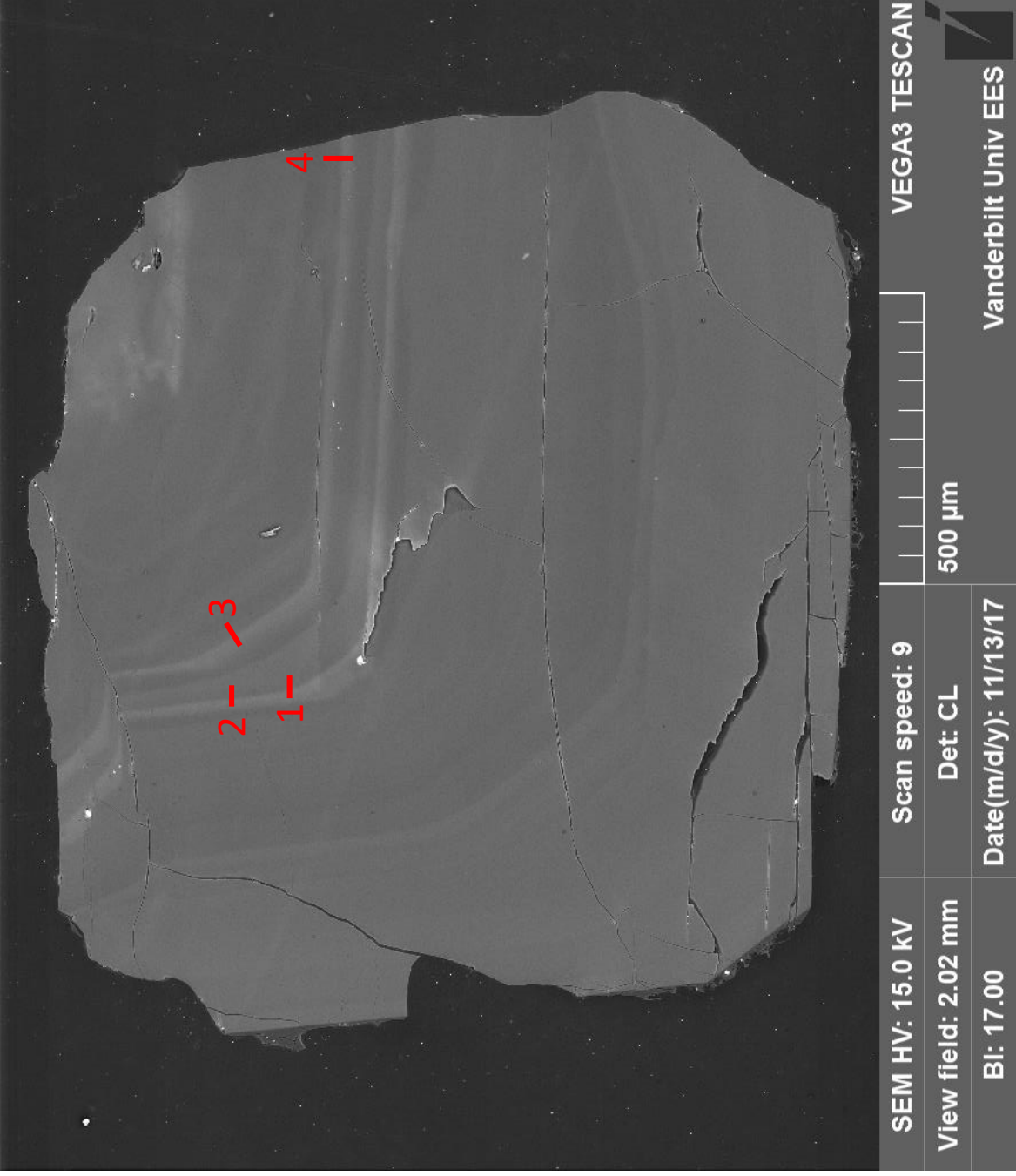
Strange cross-hatch pattern when tried to zoom in after z1.

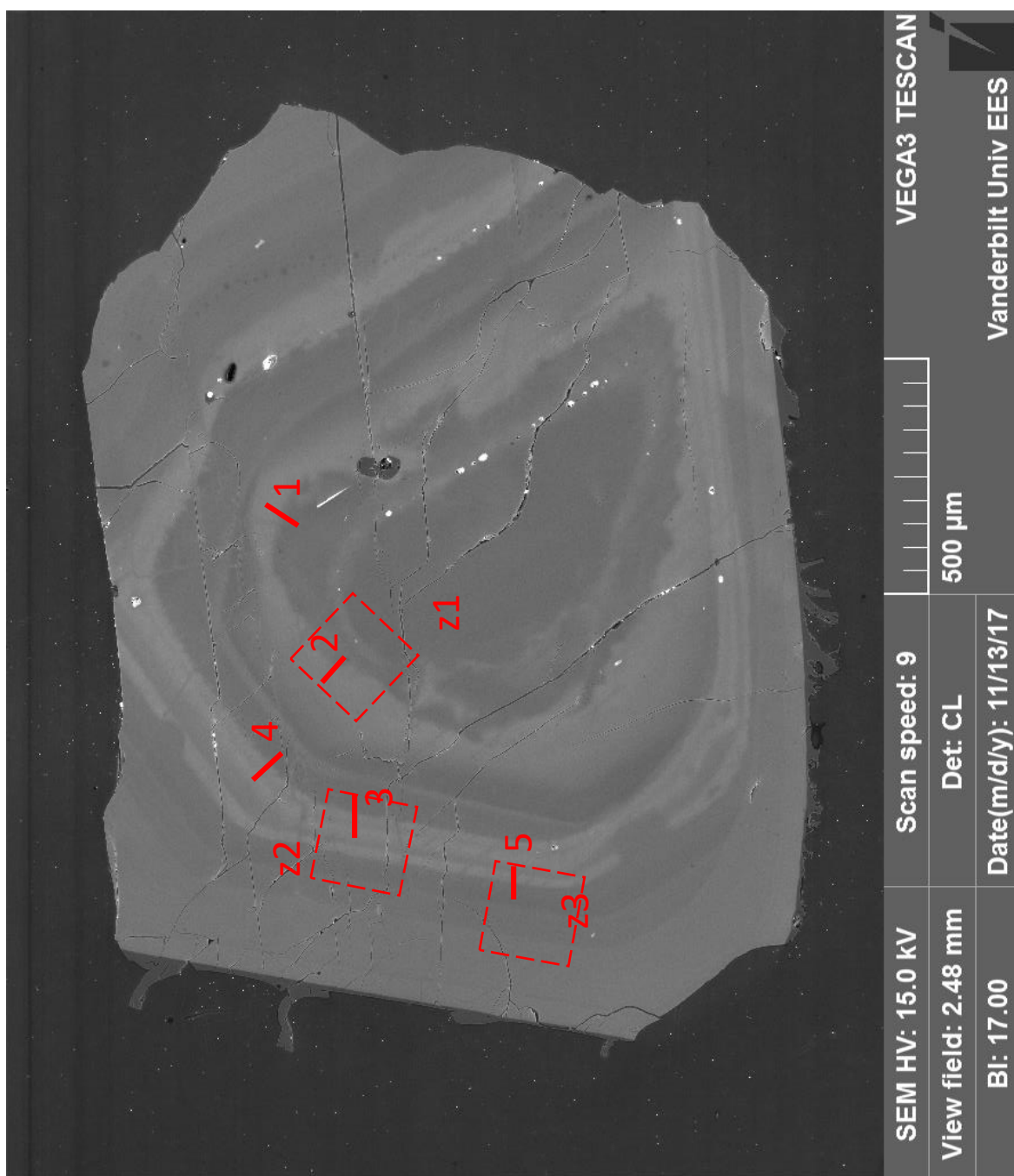


TOKA-3-301-15

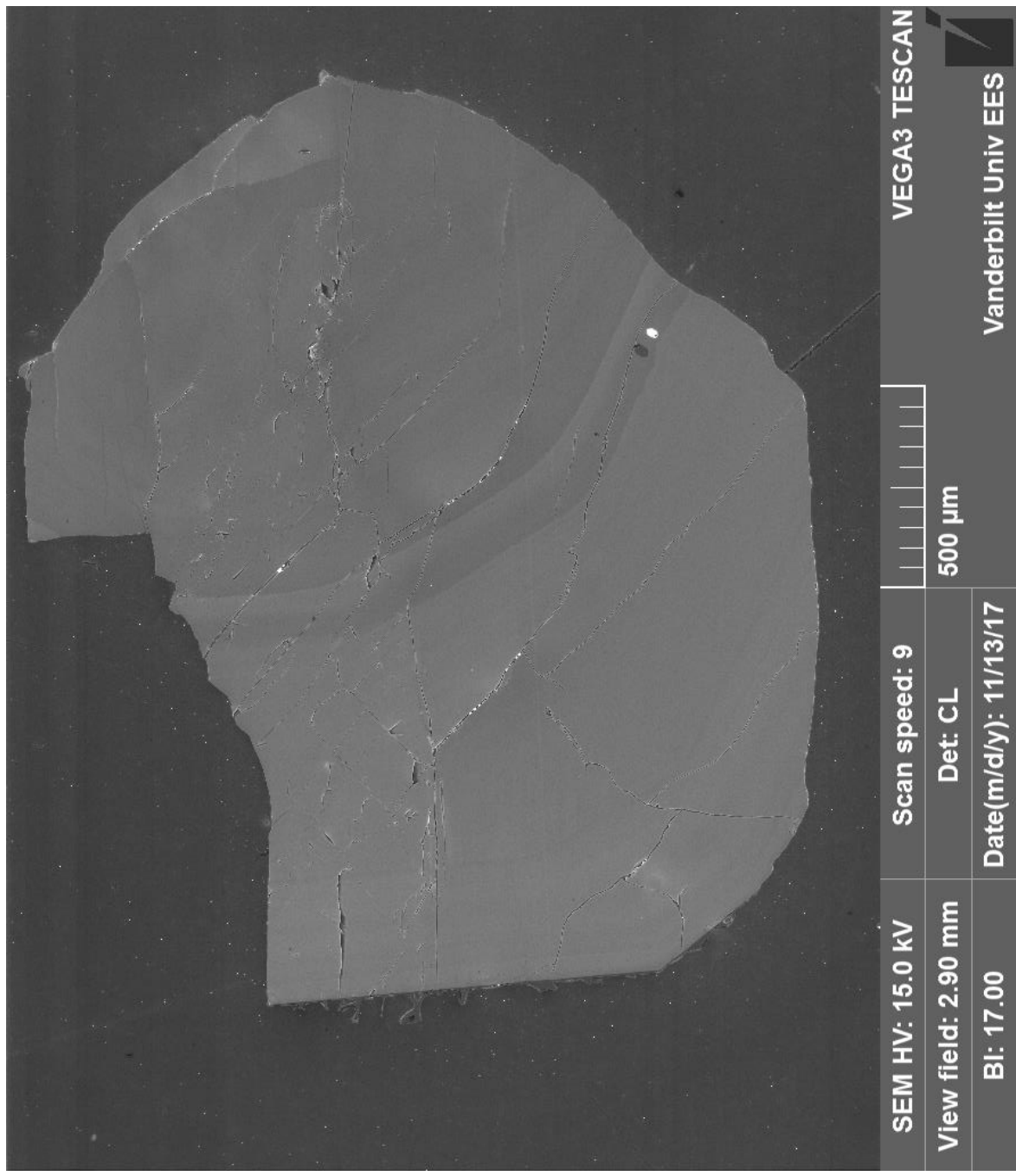


TOKA-3-301-16

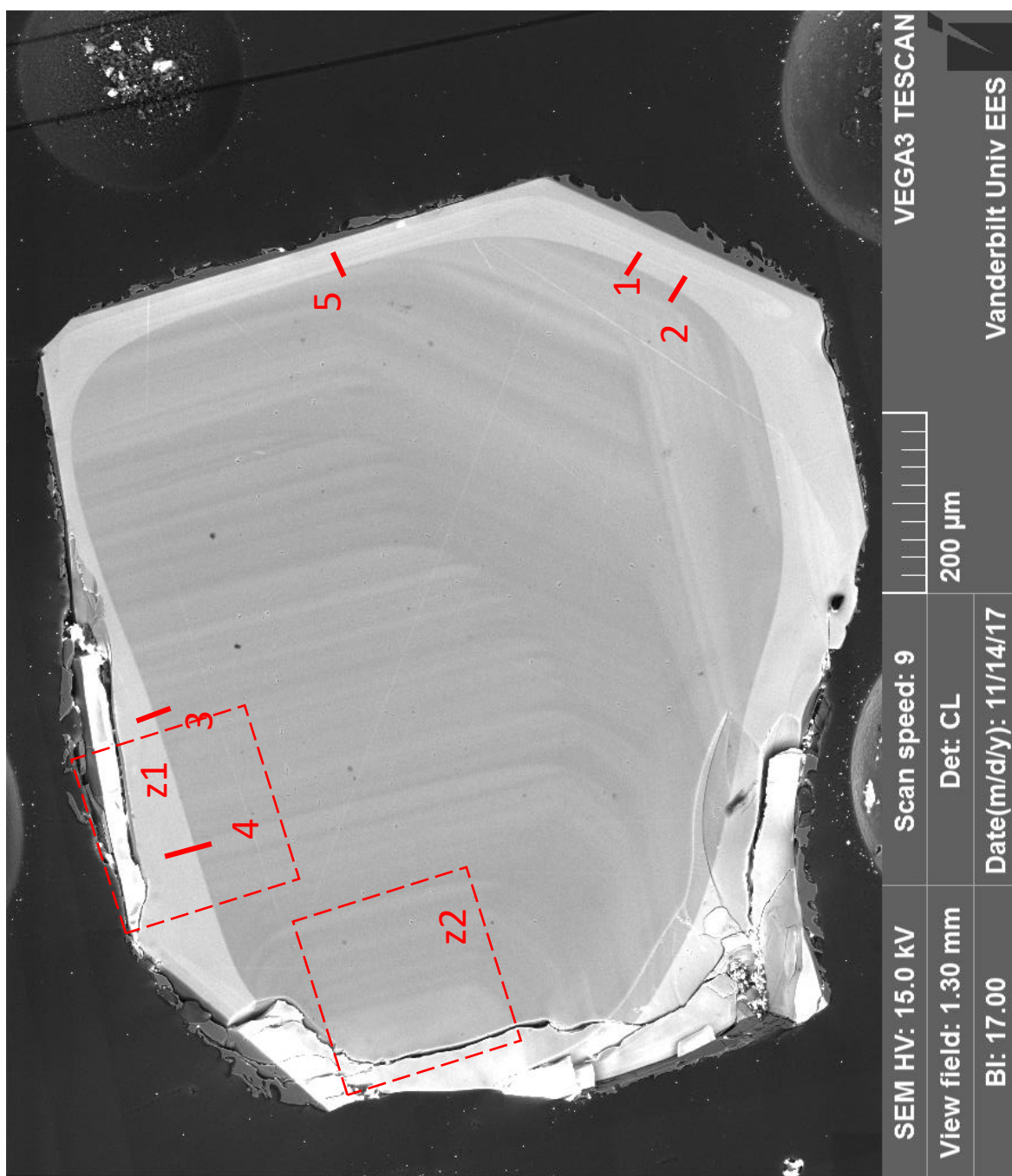


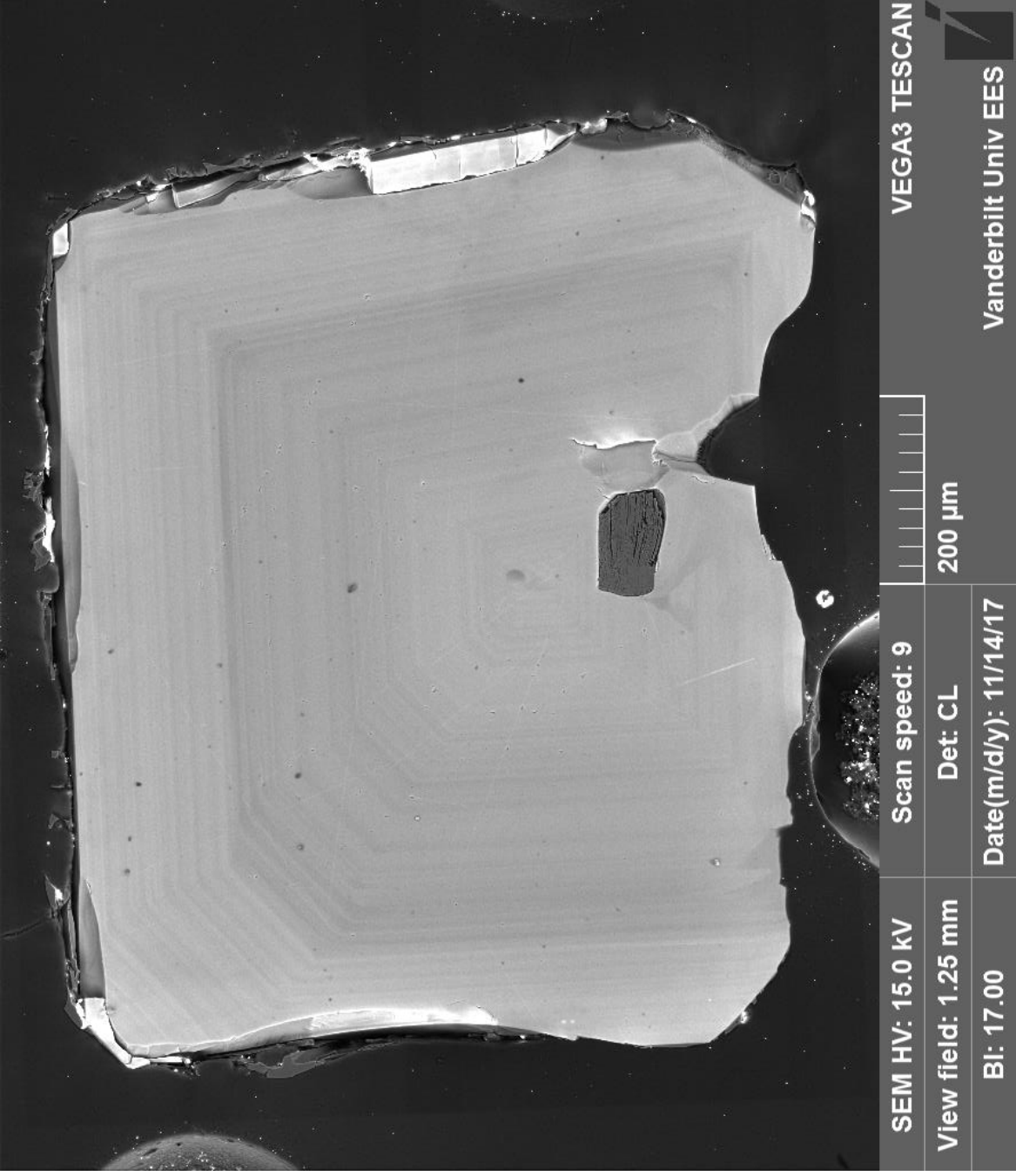


TOKA-3-301-18

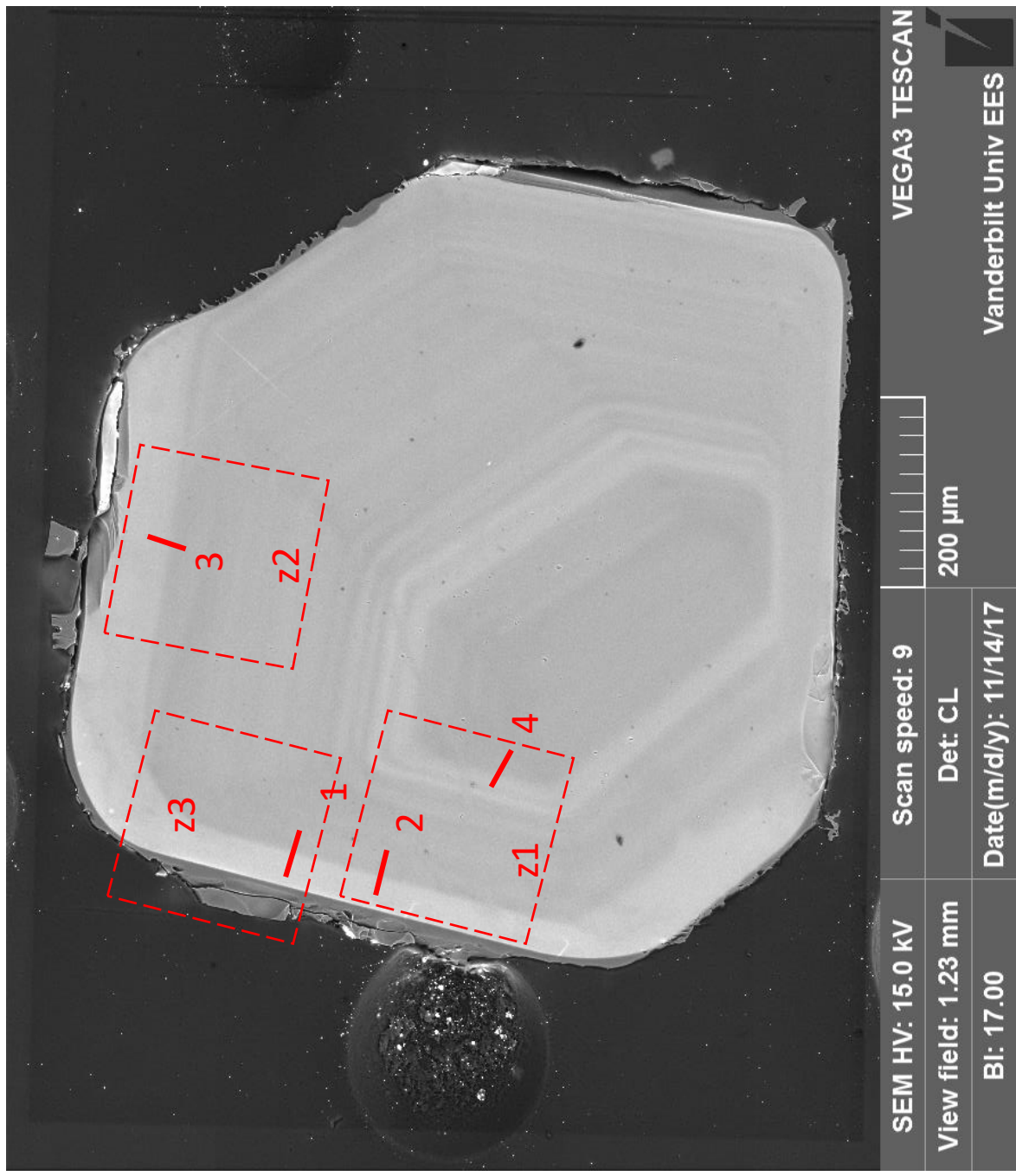


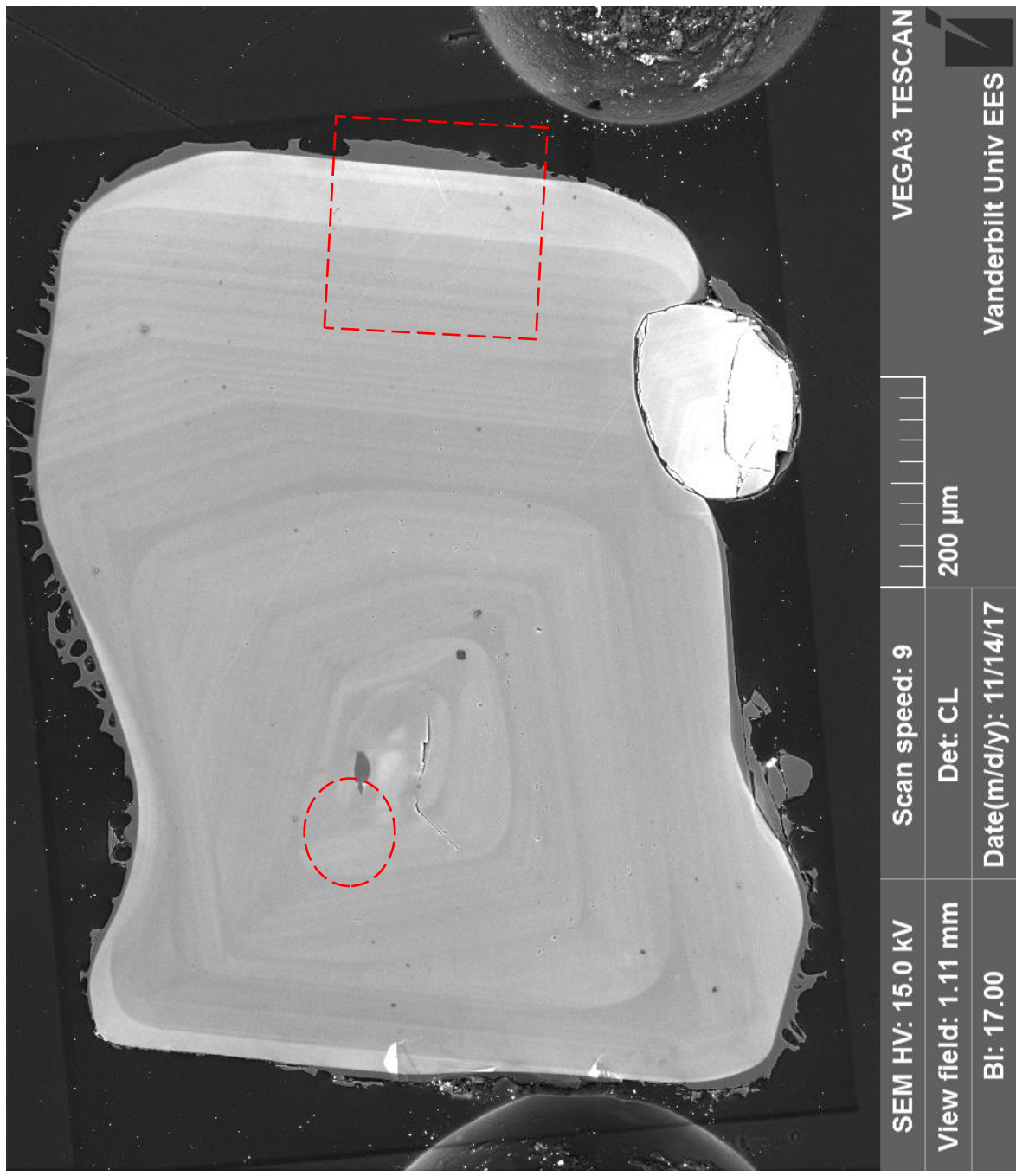
TOKA-3-301-21



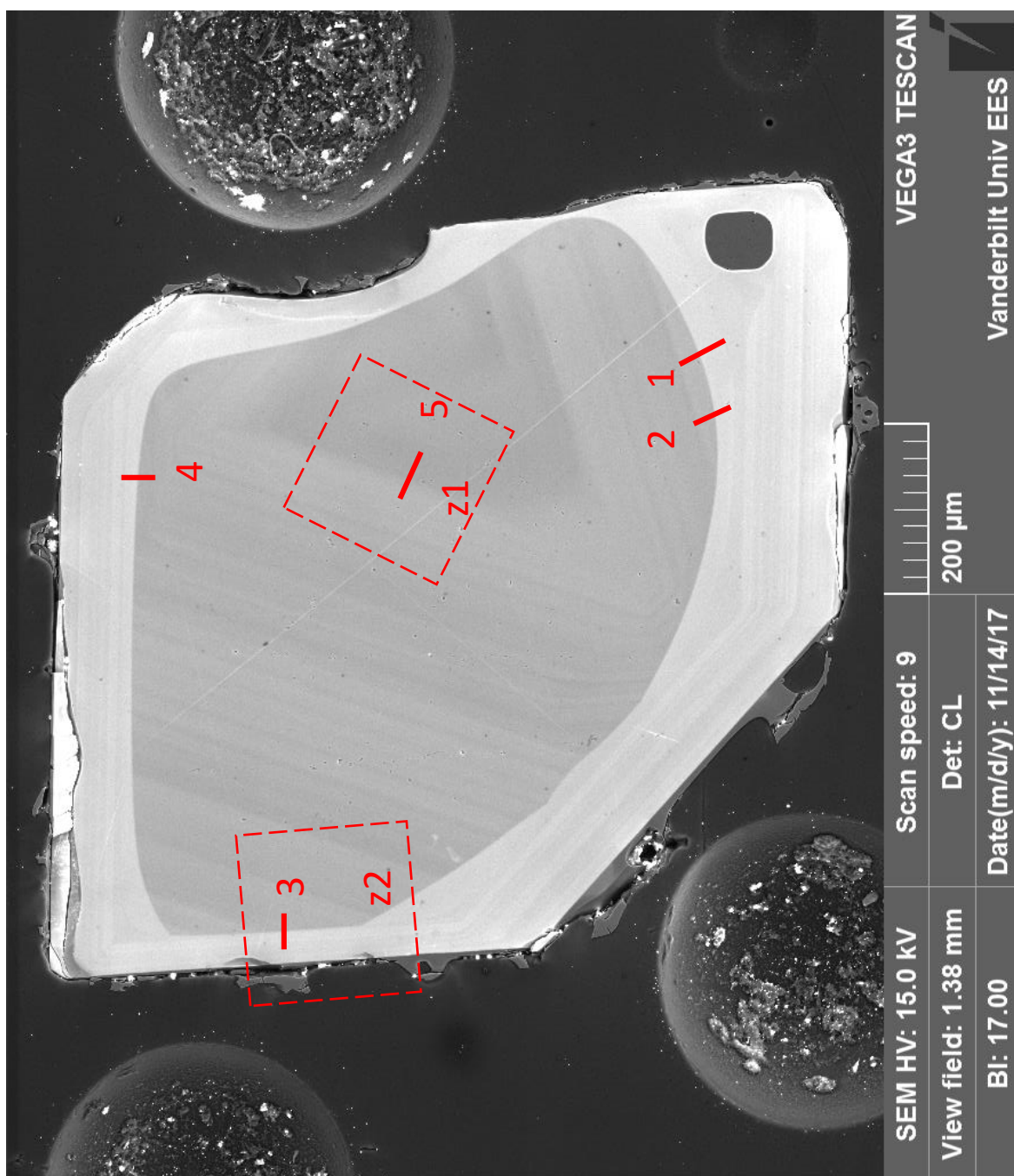


TOKA-3-301-23





TOKA-3-301-25



TOKA-3-301-26

