Gondwana reconstruction, finite rotation poles, models:

Plate Model CR25BAAF (Hotspot Reference Frame)

Africa versus hotspot reference frame

400	10.000	-40.880	139.310	1.950	
400	20.000	-40.880	139.310	3.900	
400	30.000	-40.880	139.310	5.850	
400	40.000	-40.880	139.310	7.800	
400	46.540	-40.880	139.310	9.000	
400	72.500	-35.597	144.888	14.524	
400	100.500	-32.108	141.884	20.008	
400	155.000	-23.909	142.941	31.235	
400	200.000	-18.935	142.314	40.264	
400	270.000	-16.386	139.508	53.955	
400	300.000	-19.513	132.929	61.352	**CR25BAAF**

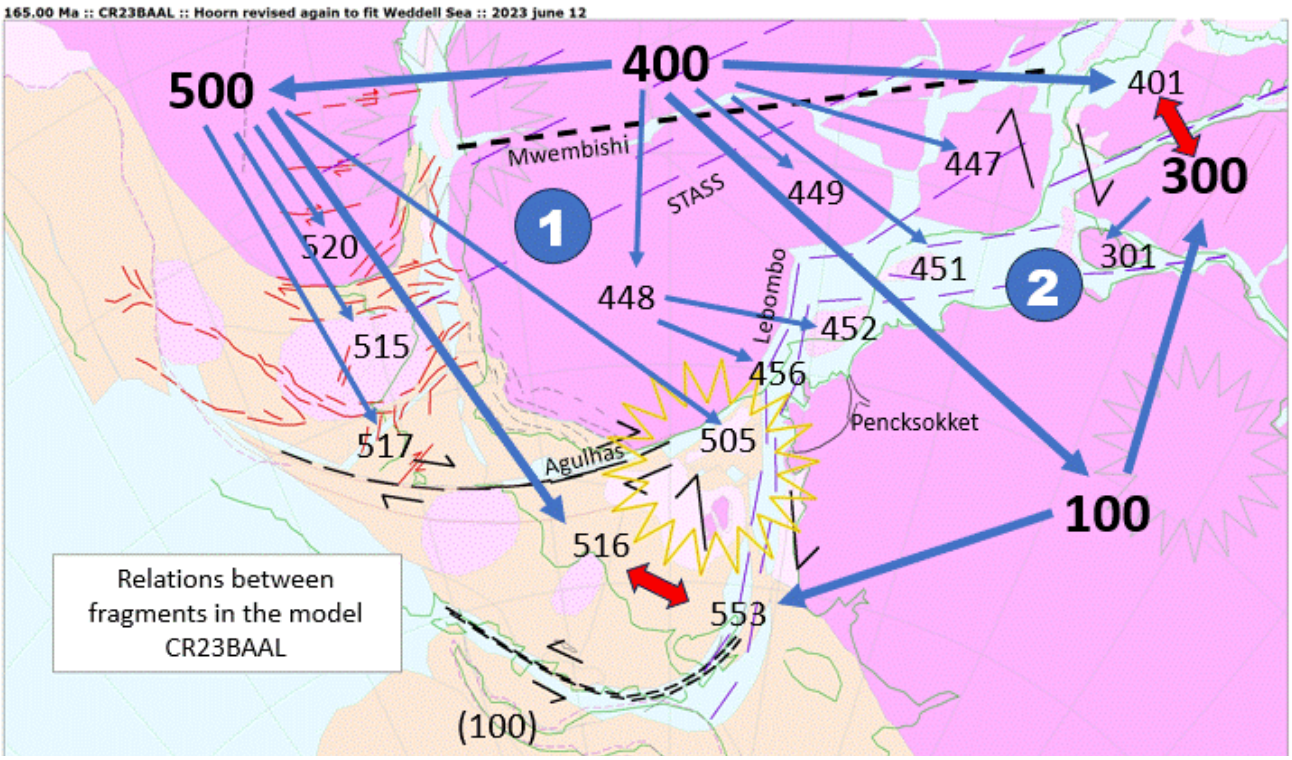

Figure 1. **The structure of the plate model in two principal plate circuits, West Gondwana (1) and East Gondwana (2), that share the relation of Antarctica to Africa. The closure of each circuit is indicated in red. The motion of Africa with respect to a global reference frame is defined in the table at the head of this page. In all the subsequent tables, the motion of the fragments is presented with respect to a fixed Africa.**

Plate model CR25AAAF (Africa fixed)

Plate Circuit 1: 553-100-448-400-500-516 (West Gondwana)

100 Antarctica versus Africa

100	22.000	5.520	-31.400	4.500	
100	38.000	7.020	-34.972	7.334	
100	53.000	1.729	-36.751	9.914	
100	67.000	-3.718	-37.707	12.103	
100	70.000	-3.439	-39.669	13.124	
100	83.640	-2.945	-37.592	18.443	**C34**
100	100.500	-0.925	-34.311	27.126	Base Cenomanian
100	113.200	-2.882	-31.935	34.448	Base Albian
100	121.400	-7.690	-28.376	40.537	**M0**, base Aptian
100	124.700	-10.998	-25.492	43.938	**M3/M2**
100	127.500	-12.208	-24.324	46.169	**M5/M4**
100	130.680	-11.803	-24.796	47.587	**M10**
100	134.700	-11.286	-25.515	48.686	**M11**
100	137.700	-10.819	-26.162	49.727	**M14**
100	142.300	-10.287	-26.894	50.972	**M18**
100	154.940	-8.923	-28.749	54.480	base Kimmeridgian
100	184.200	-9.723	-31.413	57.791	base Toarcian
100	230.000	-9.723	-31.413	57.791	
100	300.000	-10.812	-31.707	57.938	**CR25AAAF**

448 Sub-Mwembishi Africa versus Africa

448	30.000	-23.330	13.870	0.150	
448	121.400	-23.330	13.870	0.150	
448	130.680	28.223	1.785	0.472	
448	178.000	28.223	1.785	0.472	
448	179.000	15.993	3.587	0.634	
448	230.000	15.993	3.587	0.634	
448	300.000	6.923	21.929	0.389	**CR25AAAF**

120 Mid-ocean ridge in Weddell Sea versus Africa

20	22.000	45.722	-33.509	5.805	
120	38.000	8.117	-31.469	9.940	
120	50.000	-5.852	-30.837	14.268	
120	53.000	-2.663	-30.810	14.524	
120	67.000	8.857	-30.954	15.860	
120	70.000	11.587	-32.740	16.743	
120	83.640	19.538	-32.817	22.002	
120	100.500	27.018	-33.697	29.175	
120	113.200	23.445	-31.767	35.074	
120	121.400	17.243	-28.553	39.335	
120	124.700	12.433	-25.705	41.830	

120	127.500	10.363	-24.571	43.687	
120	127.520	10.363	-24.574	43.695	
120	130.680	10.824	-24.499	45.091	
120	134.700	11.172	-25.110	46.176	
120	137.700	13.421	-25.630	46.857	
120	140.490	12.501	-25.454	47.904	
120	142.300	12.559	-25.511	48.447	
120	147.000	12.554	-26.573	49.682	
120	154.940	18.116	-28.526	49.770	
120	165.000	12.989	-27.204	52.088	
120	184.200	11.698	-29.477	53.628	
120	230.000	11.698	-29.477	53.628	
120	300.000	10.534	-29.738	53.388	**CR25AAAF**

500 South America versus Africa

500	22.000	61.850	-40.740	8.100	
500	43.960	63.127	-35.982	18.086	
500	48.000	63.252	-35.786	19.084	
500	53.000	63.465	-35.445	21.082	
500	67.000	63.754	-34.973	24.569	
500	71.900	63.924	-34.690	27.218	
500	83.640	64.157	-36.637	33.842	
500	100.500	58.780	-37.459	44.663	
500	113.200	54.590	-35.286	50.500	
500	124.700	50.566	-32.593	53.444	
500	142.300	46.802	-30.658	56.247	
500	555.000	46.802	-30.658	56.247	**CR25AAAF**

516 Hoorn versus Africa

516	22.000	61.850	-40.740	8.100	
516	43.960	63.127	-35.982	18.086	
516	48.000	63.252	-35.786	19.084	
516	53.000	63.465	-35.445	21.082	
516	67.000	63.754	-34.973	24.569	
516	71.900	63.924	-34.690	27.218	
516	83.640	64.157	-36.637	33.842	
516	100.500	58.780	-37.459	44.663	
516	113.200	54.590	-35.286	50.500	
516	121.400	45.330	-32.956	52.952	
516	124.700	42.763	-31.755	54.327	
516	130.680	36.214	-29.480	57.329	
516	134.700	33.960	-28.588	58.935	
516	137.700	31.802	-27.798	60.513	
516	142.300	29.827	-27.043	62.287	
516	154.940	24.878	-25.938	65.061	
516	165.000	22.545	-25.449	66.591	
516	555.000	22.545	-25.449	66.591	**CR25AAAF**

This plate circuit closes between the (conjectural) southern-and-eastern margin of the Malvinas Plateau (Hoorn, 516) and the Weddell Sea mid-ocean ridge (120). The objective has been to create a Weddell Sea mid-ocean ridge system that develops symmetrically about the ridge (120) initiated at 142.3 Ma. The elements of the plate circuit have been adjusted so as to minimise concertina-like growth of the ocean between Antarctica and 120. The relative movement of SAM and ANT now (CR25BAAF) also trace the smooth arcs recorded in the Weddell Sea, post 100 Ma.

Other fragments that make up the model in the area of the Bouvet triple junction are:

505 Maurice Ewing Bank versus Africa

505	22.000	61.850	-40.740	8.100	
505	43.960	63.127	-35.982	18.086	
505	48.000	63.252	-35.786	19.084	
505	53.000	63.465	-35.445	21.082	
505	67.000	63.754	-34.973	24.569	
505	71.900	63.924	-34.690	27.218	
505	83.640	64.157	-36.637	33.842	
505	100.500	58.780	-37.459	44.663	
505	113.200	54.590	-35.286	50.500	
505	121.400	55.845	-37.572	53.481	
505	124.700	52.938	-35.998	54.390	
505	130.680	47.174	-33.207	56.975	
505	134.700	44.253	-32.061	57.953	
505	142.300	41.497	-30.718	57.828	
505	555.000	41.497	-30.718	57.828	**CR25AAAF**

451 Beira High versus Africa

451	30.000	-23.330	13.870	0.150	
451	121.400	-23.330	13.870	0.150	
451	130.680	48.737	-16.807	0.564	
451	160.000	48.737	-16.807	0.564	
451	184.200	-23.686	32.121	18.045	
451	230.000	-23.686	32.121	18.045	
451	300.000	-24.362	32.797	17.956	**CR25AAAF**

452 Limpopia versus Africa

452	121.400	-23.330	13.870	0.150	
452	127.500	43.400	-127.090	1.714	
452	130.680	50.446	-115.096	2.200	
452	134.700	52.888	-107.920	2.797	
452	137.500	45.479	-88.603	3.269	
452	142.300	28.762	-76.795	4.497	
452	154.940	17.070	-68.550	8.091	
452	178.000	2.701	-67.670	10.468	

452	179.000	1.864	-66.658	10.631	
452	184.200	-0.407	-66.577	11.239	
452	230.000	-0.407	-66.577	11.239	
452	300.000	-2.206	-71.760	11.079	**CR25AAAF**

456 St Lucia fragment versus Africa

456	30.000	-23.330	13.870	0.150	
456	121.400	-23.330	13.870	0.150	
456	124.700	9.910	6.310	0.239	
456	130.680	-11.092	9.652	4.350	
456	134.700	-12.561	9.939	6.616	
456	178.000	-12.561	9.939	6.616	
456	179.000	-12.601	9.869	6.815	
456	230.000	-12.601	9.869	6.815	
456	300.000	-14.176	11.094	6.625	**CR25AAAF**

There are also three fragments between South America (500) and the Hoorn fragment (516):

520 Uruguay versus Africa

520	22.000	61.850	-40.740	8.100	
520	43.960	63.127	-35.982	18.086	
520	48.000	63.252	-35.786	19.084	
520	53.000	63.465	-35.445	21.082	
520	67.000	63.754	-34.973	24.569	
520	71.900	63.924	-34.690	27.218	
520	83.640	64.157	-36.637	33.842	
520	100.500	58.780	-37.459	44.663	
520	113.200	54.590	-35.286	50.500	
520	124.700	50.566	-32.593	53.444	
520	130.680	49.251	-31.882	54.371	
520	142.300	46.151	-30.272	56.852	**CR25AAAF**

515 South of BA No1 versus Africa

515	48.000	63.252	-35.786	19.084	
515	53.000	63.465	-35.445	21.082	
515	67.000	63.754	-34.973	24.569	
515	71.900	63.924	-34.690	27.218	
515	83.640	64.157	-36.637	33.842	
515	100.500	58.780	-37.459	44.663	
515	113.200	54.590	-35.286	50.500	
515	121.400	51.684	-33.289	52.573	
515	124.700	48.599	-32.291	53.473	
515	130.680	43.826	-31.132	54.680	
515	142.300	37.327	-28.460	58.269	**CR25AAAF**

517 South of BA No2 versus Africa

517	22.000	61.850	-40.740	8.100	
517	43.960	63.127	-35.982	18.086	
517	48.000	63.252	-35.786	19.084	
517	53.000	63.465	-35.445	21.082	
517	67.000	63.754	-34.973	24.569	
517	71.900	63.924	-34.690	27.218	
517	83.640	64.157	-36.637	33.842	
517	100.500	58.780	-37.459	44.663	
517	113.200	54.590	-35.286	50.500	
517	124.700	44.382	-32.053	53.773	
517	128.000	41.974	-31.545	54.541	
517	142.300	33.873	-28.549	59.709	
517	145.000	33.873	-28.549	59.709	**CR25AAAF**

Fragments 449 (Zimbabwe) and ***447 (North Mozambique)*** share the same movements as 448.

Plate Circuit 2: 401-400-448-100-300 (East Gondwana)

100 Antarctica versus Africa

100	22.000	5.520	-31.400	4.500	
100	38.000	7.020	-34.972	7.334	
100	53.000	1.729	-36.751	9.914	
100	67.000	-3.718	-37.707	12.103	
100	70.000	-3.439	-39.669	13.124	
100	83.640	-2.945	-37.592	18.443	**C34**
100	100.500	-0.925	-34.311	27.126	Base Cenomanian
100	113.200	-2.882	-31.935	34.448	Base Albian
100	121.400	-7.690	-28.376	40.537	**M0**, base Aptian
100	124.700	-10.998	-25.492	43.938	**M3/M2**
100	127.500	-12.208	-24.324	46.169	**M5/M4**
100	130.680	-11.803	-24.796	47.587	**M10**
100	134.700	-11.286	-25.515	48.686	**M11**
100	137.700	-10.819	-26.162	49.727	**M14**
100	142.300	-10.287	-26.894	50.972	**M18**
100	154.940	-8.923	-28.749	54.480	base Kimmeridgian
100	184.200	-9.723	-31.413	57.791	base Toarcian
100	230.000	-9.723	-31.413	57.791	
100	300.000	-10.812	-31.707	57.938	**CR25AAAF**

401 Madagascar versus Africa

401	20.000	-23.330	13.870	0.300	
401	117.300	-23.330	13.870	0.300	
401	121.400	5.897	-94.991	2.131	
401	124.700	7.510	-98.917	5.122	
401	127.500	7.933	-99.963	8.169	
401	130.680	8.083	-100.337	10.368	
401	142.300	4.436	-94.382	14.154	
401	154.940	1.866	-86.618	17.531	
401	184.200	-5.453	-83.612	20.811	
401	230.000	-5.453	-83.612	20.811	
401	300.000	-8.483	-83.831	20.702	
401	555.000	-8.483	-83.831	20.702	**CR25AAAF**

India versus Africa

300	33.430	-14.007	-125.204	18.906	
300	38.000	-14.812	-129.342	22.133	
300	42.860	-16.215	-132.800	25.733	
300	53.000	-17.086	-143.195	32.037	
300	67.000	-18.234	-153.188	41.813	
300	70.000	-18.475	-153.824	44.070	
300	72.500	-18.798	-154.505	45.493	
300	83.640	-20.707	-156.154	53.084	
300	89.000	-21.315	-157.218	57.248	
300	100.500	-21.424	-157.462	57.056	
300	113.200	-21.238	-157.163	57.452	
300	117.300	-21.346	-157.231	57.203	
300	121.400	-21.499	-154.905	58.477	
300	124.700	-21.723	-152.236	59.879	
300	127.500	-22.046	-149.908	61.127	
300	130.680	-22.188	-147.786	62.587	
300	134.700	-22.614	-146.567	63.159	
300	137.700	-23.061	-145.456	63.618	
300	142.300	-23.512	-144.138	64.334	
300	154.940	-25.574	-140.663	64.745	
300	184.200	-28.638	-138.670	66.458	
300	230.000	-28.638	-138.670	66.458	
300	300.000	-29.376	-139.375	66.766	**CR25AAAF**

448 Southern Kalahari versus Africa

448	30.000	-23.330	13.870	0.150	
448	121.400	-23.330	13.870	0.150	
448	130.680	28.223	1.785	0.472	
448	178.000	28.223	1.785	0.472	
448	179.000	15.993	3.587	0.634	
448	230.000	15.993	3.587	0.634	
448	300.000	6.923	21.929	0.389	
448	555.000	6.923	21.929	0.389	**CR25AAAF**

Fragments 449 (Zimbabwe) and ***447 (North Mozambique)*** share the same movements as 448.

This plate circuit closes between India and Madagascar. The movements of Madagascar against Africa and of India against Antarctica have been adjusted to minimise/eliminate relative movement between Madagascar and India before 130.68 Ma. The movement of India against Antarctica has been refined to ensure steady strike-slip movement of (Greater)India along (a) the long transform off Western Australia, 142.3 to 100.5 Ma and (b) the Davie Fracture Zone 142.3 to 130.68, i.e. while Madagascar is still fully attached to India.

200 Australia versus Africa

200	22.000	-15.236	-125.573	12.321	
200	33.430	-15.703	-126.463	19.036	
200	38.000	-15.882	-125.695	20.710	
200	42.860	-16.917	-125.176	22.580	
200	53.000	-14.777	-120.275	23.598	
200	67.000	-13.133	-115.332	25.343	
200	70.000	-12.373	-113.286	26.253	
200	83.640	-10.487	-102.707	28.808	
200	100.500	-10.390	-94.024	34.973	
200	113.200	-14.222	-83.484	37.998	
200	121.400	-20.538	-75.038	40.213	
200	124.700	-25.021	-69.911	41.182	
200	127.500	-26.885	-66.894	42.238	
200	130.680	-26.569	-65.771	43.526	
200	134.700	-26.034	-65.232	44.719	
200	137.700	-25.555	-64.755	45.845	
200	142.300	-25.012	-64.221	47.188	
200	154.940	-23.641	-62.900	50.944	
200	184.200	-24.400	-63.201	55.082	
200	230.000	-24.400	-63.201	55.082	
200	300.000	-25.497	-63.563	55.372	
200	555.000	-25.497	-63.563	55.372	**CR25AAAF**

Australia does not form part of either plate circuit. Rotations are included for completeness. The Australia-Antarctica poles are taken largely from published work supplemented with a closer fit to Antarctica in conformity with the principles adopted throughout our Gondwana reassembly.

301 Sri Lanka versus Africa

301	22.000	-13.511	-124.295	12.237
301	33.430	-14.007	-125.204	18.906
301	38.000	-14.812	-129.342	22.133
301	42.860	-16.215	-132.800	25.733

301	53.000	-17.086	-143.195	32.037	
301	67.000	-18.234	-153.188	41.813	
301	70.000	-18.475	-153.824	44.070	
301	72.500	-18.798	-154.505	45.493	
301	83.640	-20.707	-156.154	53.084	
301	89.000	-21.315	-157.218	57.248	
301	100.500	-21.424	-157.462	57.056	
301	109.000	-21.299	-157.261	57.321	
301	112.200	-16.887	-149.796	63.248	
301	113.200	-15.699	-148.064	65.277	
301	117.300	-11.482	-142.070	73.784	
301	121.400	-8.205	-136.300	85.245	
301	124.700	-10.348	-136.546	82.650	
301	127.500	-12.074	-136.652	80.134	
301	130.680	-12.761	-135.728	80.727	
301	134.700	-13.812	-135.341	79.947	
301	137.700	-14.725	-134.882	79.427	
301	142.300	-15.924	-134.407	78.546	
301	154.940	-17.840	-131.886	79.560	
301	184.200	-20.544	-130.798	81.476	
301	230.000	-20.544	-130.798	81.476	
301	300.000	-21.131	-131.434	81.618	
301	555.000	-21.131	-131.434	81.618	**CR25AAAF**

Sri Lanka is confined between India and Antarctica, escaping first by growth of ocean between it and India, then between it and Antarctica.

404 Madagascar Rise versus Africa

404	20.000	-23.330	13.870	0.300	
404	63.500	-23.330	13.870	0.300	
404	72.500	7.604	-43.820	2.112	
404	89.000	10.350	-48.603	7.098	
404	117.300	10.350	-48.603	7.098	
404	121.400	11.438	-60.671	8.656	
404	124.700	11.976	-71.000	11.108	
404	127.500	12.122	-77.581	13.823	
404	130.680	12.136	-80.908	15.857	
404	142.300	8.965	-80.763	19.798	
404	154.940	6.332	-77.190	23.496	
404	184.200	0.202	-76.404	26.730	
404	230.000	0.202	-76.404	26.730	
404	300.000	-2.134	-76.625	26.525	**CR25AAAF**

CVR
Delft, 2025 March 7

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