

Open Seminar Series

Geoscience & Remote Sensing

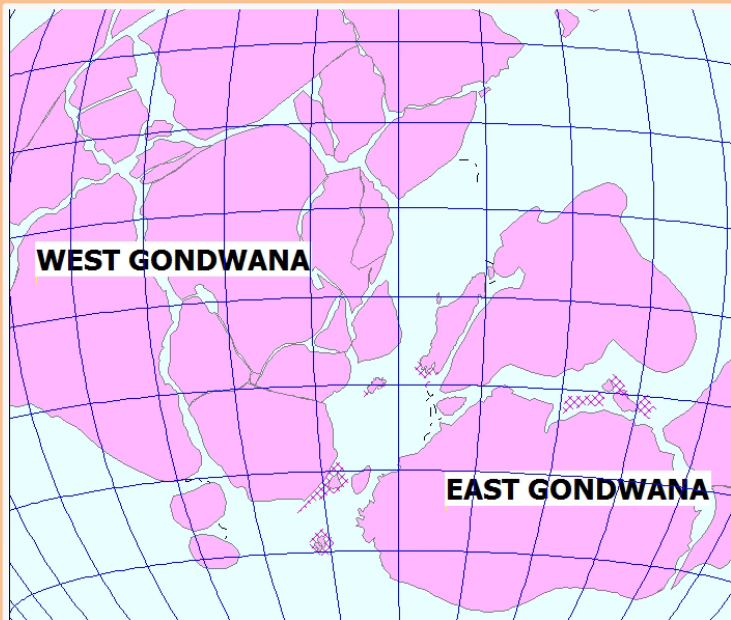
4 Gs: Geomagnetism, Geodynamics, Gondwana - and Gas?

Colin Reeves – ITC (retired)

February 11, 2016

12:40-13:30

CiTG room G



The southern continents at about 140 million years ago

(a). The earth has a magnetic field that changes with time – **Geomagnetism (G1)**. (b). The continents move over time with creation of new ocean crust separating them – **Geodynamics (G2)**. From these two phenomena it is possible to retrace the growth of oceans by measuring ‘anomalies’ in the geomagnetic field over the oceans. Such ocean-growth models may be refined by using gravity anomalies over the many ‘transform faults’ where the mid-ocean ridge is offset. The South Atlantic Ocean is the classic example of ocean-floor spreading that led to the idea that the southern continents were once all united as a single continent – **Gondwana (G3)**.

Unlike the Atlantic Ocean, the Indian Ocean has undergone several distinct phases of growth. It is described here in four ‘Regimes’. The starting position of the Gondwana fragments that used to lie adjacent to the east coast of Africa is demonstrated from gravity anomalies over the margins of the different conjugate continents. The earliest phases of disruption – 150 to 200 million years ago – are at the same time the most difficult to decipher and the most important from the point of view of exploring and explaining the abundant **Gas (G4)** fields that have been found off Mozambique and Tanzania.