Tectonic Spiral Structures of the Tethyan Vortex Street (Revisited) GRACE Geoid Interpretations and African Lightning Teleconnections

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ABSTRACT

The Tethyan Vortex Street (TVS) spiral structures (Fig. 1) are exemplified by 1.) Sestri Spiral, 2.) Aegean Spiral, 3). Kersihir Spiral, 4). Spiral of the Lut desert, 5). Tibesti Spiral, and 6). Arabia Spiral, [1, 2]. Counter-clockwise spiral structures of the TVS are also common features along the world-encircling vortex street [3]. The 6 spirals have associated gravity highs from GRACE geoid data (Fig. 2) and may be associated with active or dormant joule spikes [4]. Monthly geoid mgal values are data mined from GRACE missions between Feb. 2003 to Nov. 2005 and thermal expansion indicators are examined for each tectonic spiral, while external teleconnections to other gravitational and electrical indicators are sought. Annual flash rates of anomalous lightning over the Congo (Fig. 3) have a similar geospatial pattern and location to the geoid low exhibited in GRACE (Fig. 4). One observation is the joule spike heating elements are generally associated with GRACE gravity highs, while one of the largest lightning grounding areas in the Congo appears as a gravity low. GRACE gravitational teleconnections (Fig. 5) of the Congo and African Rift area exhibit strong teleconnection signals to the Aegean Spiral, while exhibiting weaker links to the Lut Spiral. Extreme amounts of lightning arcing into the mantle underneath Congo and telluric attraction to neighboring joule spikes in Uganda, supplies soldering rift energies which may be capable of anchoring the African continent, and may supply new theoretical evidence suggesting why Africa is considered the most stable of continents of the Pangean Breakup [5]. In addition, African lightning has been linked to tropical Atlantic cyclone formation [6] and unraveling some of these complexities may be possible (Fig. 6 and Fig. 7). Monitoring Acoustic Emissions (AE) [7] and electrical indicators at some key electrical sources and sinks may determine relevant timing information related to tropical hurricane activity.

Keywords: Tectonic Spirals, GRACE Geoid, Gravity Teleconnections, Lightning, Tropical Atlantic, Cyclone Formation

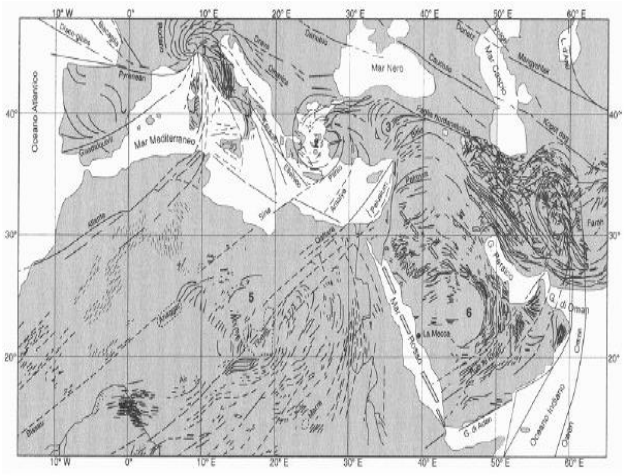

Fig. 1. Tectonic Spiral Structures of the Tethyan Vortex Street 1.) Sestri Spiral, 2.) Aegean Spiral, 3). Kersihir Spiral, 4). Spiral of the Lut desert, 5). Tibesti Spiral, and 6). Arabia Spiral. From: Neev and Hall 1982 [1].

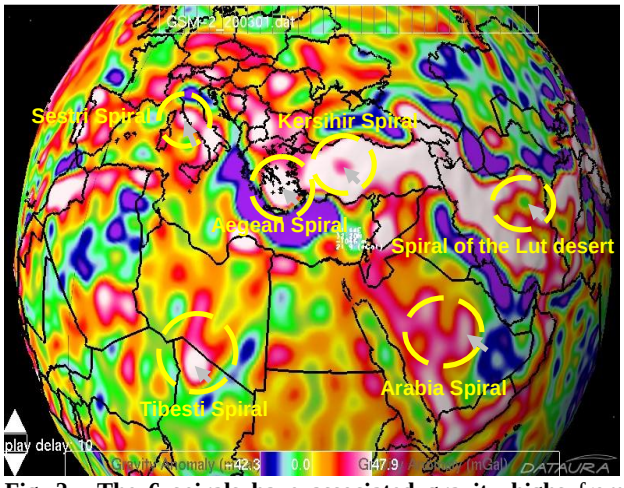

Fig. 2. The 6 spirals have associated gravity highs from GRACE geoid data. (Geoid Explorer – Dataua)

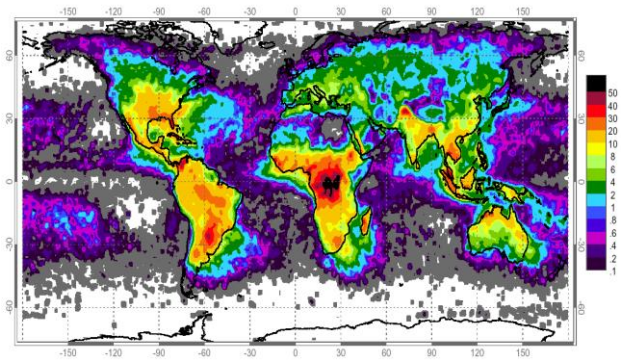

Fig. 3. High Resolution full Climatology Annual Flash Rate Global distribution of lightning April 1995-February 2003 from the combined observations of the NASA OTD (4/95-3/00) and LIS (1/98-2/02) instruments. Lightning Annual Flash Rate has a similar geospatial pattern to the GRACE geoid anomaly in the Congo. Data from space-based optical sensors reveal the uneven distribution of worldwide lightning strikes. Units: flashes/km^2/yr. Image credit: NSSTC Lightning Team. (http://science.nasa.gov/headlines/y2001/ast05dec_1.htm)

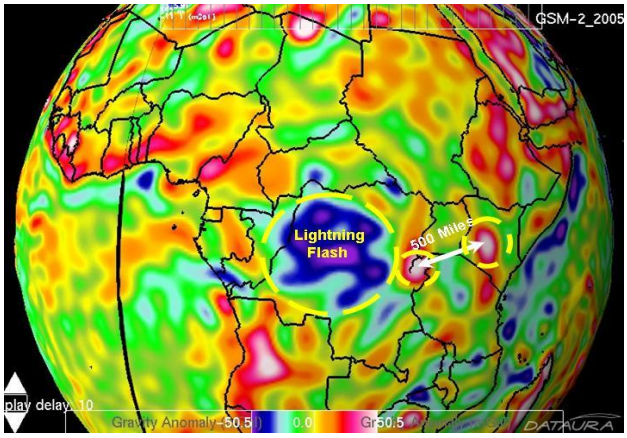

Fig. 4. Annual flash rates of Anomalous Lightning over the Congo in (Fig. 3) have a Similar Geospatial Pattern and Location to the Geoid low exhibited in GRACE. 500 miles separate the Nyamuragira and Africa Rift Joule Spikes. (Geoid Explorer – Dataua)

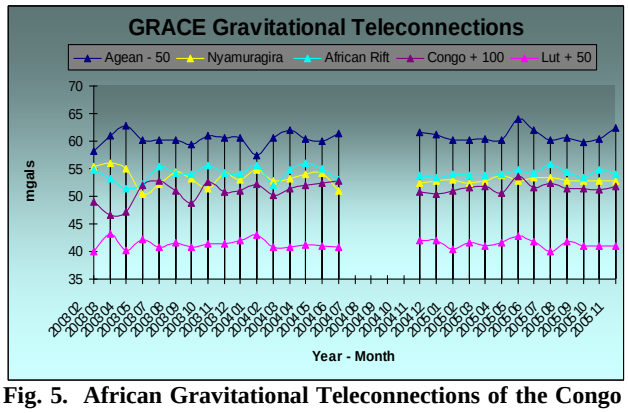

Fig. 5. African Gravitational Teleconnections of the Congo and Rift area have Strong Teleconnections to the Agean Spiral, while Exhibiting weaker links to the Lut Spiral. The Agean Teleconnection has an inverse relationship in 2004-01, but after the data gap the relationship becomes in phase in 2005-05. Some speculation is that the data gap and phase change may possibly be tied to the polarity reversal at the latest solar minimum.

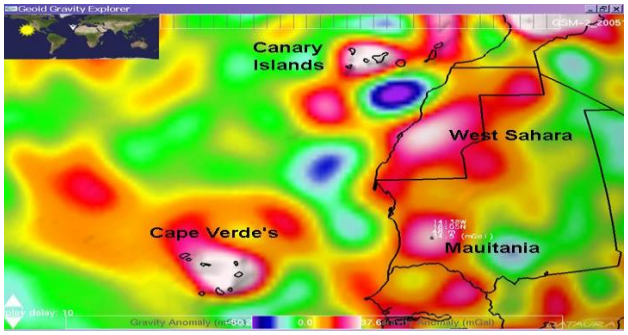

Fig. 6. The Canary Islands exhibit the strongest Congo Teleconnection, while Weaker yet Pronounced Teleconnections to other local Joule Spikes in the Cape Verde's, West Sahara, and Mauitania are suspected to have links to Hurricane Formation. Detailed Lightning observations may unravel this complex relationship. (Geoid Explorer – Dataua)

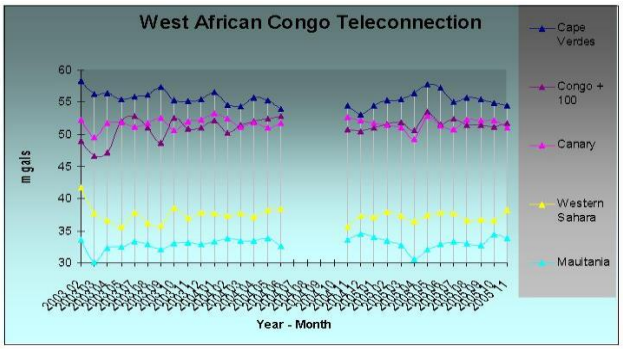

Fig. 7. West African Gravitational Teleconnections to the Congo are Strongest in the Canary Islands. Inverse and in phase signals are noted at 2003-09, 2004-01, and between 2005-04 to 2005-07. These Teleconnections are likely more than random events but have not yet been correlated to other physical evidence.

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