



Palaeomagnetism of the Ezhimala Granite-Granophyre-Gabbro Complex, Southwest Coast of India

Mathew Joseph (1), Mireille Perrin (), Tallavjhala Radhakrishna (), Jean Marie Dautria (), Pierre Camps (), and G Balasubramonium ()

(1) CNRS-INSU / Géoscience Montpellier, France (mireille.perrin@univ-montp2.fr), (2) Centre for Earth Science Studies, Trivandrum, 695031 India, (3) Geological Survey of India, Trivandrum, 695013 India

The igneous complex at Ezhimala, southwestern coast of India, consists mainly of granite, granophyre and gabbro and is cut by dolerites. It occurs as a linear ridge with a NNW-SSE trend. This complex is considered to be Precambrian in age, following Rb-Sr determinations at 678 Ma.

Paleomagnetic samples were collected from one site in the doleritic dyke and six sites in the complex, out of which three are from gabbro, two from granophyre and one from granite. The high-temperature susceptibility measurements on selected specimens from each site have indicated magnetite as the main carrier of magnetization. Samples were subjected to detailed step-wise alternating field demagnetisation. After removal of a secondary viscous component, a characteristic mean remanent magnetization could be estimated for all samples. The mean directions per sites are very well defined with [U+F061] 95 confidence circles between 2.5° and 5.0° (kappa between 243 and 580).

The mean paleomagnetic direction associated with the complex corresponds to $D/I = 308.6/-58.9$ ($k = 473$ and $95 = 3.1^\circ$) with a paleopole position at $66.0^\circ\text{W}/19.4^\circ\text{N}$. This direction is almost identical to the direction obtained from the cross-cutting doleritic dyke with $D/I = 301.8/-62.9$ ($kappa = 755$ and $95 = 1.9^\circ$), and similar to 90 Ma poles derived from other areas in south western India (St. Mary Group of Islands, leucogabbro dykes of central and north Kerala and dykes of the Coimbatore-Agali area). Therefore palaeomagnetic analysis of the complex strongly suggests a Cretaceous age for the Ezhimala complex and would indicate a much more widespread magmatic activity around 90 Ma along the south western coast of India. Geochemical studies and Ar-Ar dating of the complex are in progress to confirm the paleomagnetic observation.