

Late Pliocene polarity reversals and transitions from an on-shore drilled core of the Ananai Formation in southeast Shikoku, Japan

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<http://www.kochi-u.ac.jp/marine-core/>

We present a paleomagnetic record of polarity reversals and transitions of the Gauss normal Polarity Chron, or C2An, obtained from a 70 m long core sample collected by on-shore drilling of the Pliocene Ananai Formation, which is distributed along the northwestern coast of the Muroto Peninsula, southeast Shikoku. Because of the excellent recovery rate, which is more than 90 %, and the stable magnetic characteristics of siltstones and fine sandstones of the Ananai Formation, the drilled core has yielded a well-defined magnetostratigraphy, which includes two normal and three reversed polarity zones. Whole core measurements were made at first, using a pass-through cryogenic magnetometer on board the D/V Chikyu, in order to obtain a magnetostratigraphic overview and locate polarity boundaries, and then discrete samples, collected more densely from portions containing the possible polarity transitions and excursions, were measured at an on-shore laboratory of CAMCore, Kochi University.

Reversal records of the core show an overall pattern that appears to be correlatable with the early Late Pliocene geomagnetic polarity time scale; the three reversed zones could be assigned, from the top to bottom, to the Kaena Subchron (C2An.1r), the Mammoth Subchron (C2An.2r), and the upper Gilbert Chron (C2Ar). Consequently, four polarity boundaries were recognized, and three of them were recorded as transitional zones 40-60 cm thick. Each zone is most likely correlatable with the lower Kaena polarity transition, the upper and lower Mammoth transitions, respectively. They provide information of the behavior of the geomagnetic field as it reverses, especially for transitions of the Late Pliocene polarity subchrons, which have rarely been reported so far.