

Absolute motion of the Pacific Plate from Late Jurassic to Early Cretaceous; skewness analysis of the Mesozoic magnetic anomalies

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To expose the absolute motion of the Pacific Plate, it is effective to construct an apparent polar wander path (APWP) for the plate. In general, paleomagnetic studies of the plate are a common study to construct an APWP. It is, however, difficult to obtain rock samples of every age in Pacific Plate that entirely covered with seawater. Seamount inversion and skewness analysis of the Mesozoic Pacific Plate have conducted by previous works, but both methods have not been able to construct any reasonable models of APWP.

Mesozoic magnetic anomaly lineations exist in the northwestern Pacific Ocean. The Pacific Plate originated from the triple junction among Izanagi, Farallon, and Phoenix plates (Nakanishi et al, 1992). Pacific-Izanagi, Pacific-Farallon, and Pacific-Phoenix ridges had made Japanese lineation set, Hawaiian lineation set, and Phoenix lineation set, respectively (e.g., Nakanishi et al. [1992]). In this study, we determined skewness parameters of M1-M25 lineations of Japanese, Hawaiian, and Phoenix lineation sets, which range from 122 Ma to 156 Ma. We obtained the paleomagnetic poles of chrons M22 (152 Ma), M18 (145 Ma), M8 (129 Ma), and M5 (127 Ma). On based on the results, we constructed APWP for Pacific Plate. The latitude of the paleomagnetic poles for chron M22 is close to that for chron M18. The position of the paleomagnetic pole for chron M8 is situated south of that for chron M18. This implies that the direction of the absolute motion of Pacific Plate from chron M22 to chron M18 was E-W and that after chron M18 was southward. The positions of paleomagnetic poles for chrons M8 and M5 estimated from Japanese and Hawaiian lineation sets are different from that of Phoenix lineation set. The paleomagnetic pole estimated from Japanese and Hawaiian lineation sets moved northward from chron M8 to chron M5. The paleomagnetic pole estimated from Phoenix lineation set moved southward. This implies that the part of the Pacific Plate where Phoenix lineation set after chron M18 exists moved northward against the part of the Pacific Plate where Japanese and Hawaiian lineation sets exist.