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COMPACTION-INDUCED INCLINATION SHALLOWING IN CRETACEOUS DSDP SEDIMENTS FROM THE PACIFIC PLATE

Þórður Arason, Orkustofnun - National Energy Authority of Iceland, Grensásvegi 9, IS-108 REYKJAVÍK, Iceland
Shaul Levi, College of Oceanography, Oregon State University, Oceanography Administration Building 104, Corvallis, OREGON 97331-5503, U. S. A.

Paleomagnetic inclinations of Cretaceous Deep Sea Drilling Project (DSDP) sediments from the Pacific plate are known to be systematically shallower than predicted from paleolatitudes of hot spot reconstructions. In this study we reexamine published data and try to explain the shallow Cretaceous inclinations as a result of sediment compaction. We obtain mean paleomagnetic inclinations I_P of published paleomagnetic data from DSDP sediments; the expected inclinations I_H are from hot spot paleolatitude reconstructions, which are in agreement with sedimentless apparent polar wander paths. Sediment compaction ΔV is estimated from DSDP density and porosity data, assuming lithology dependent initial values. These data and the equation for compaction-induced inclination shallowing, $\tan I_P = (1 - a \Delta V) \tan I_H$, are used to calculate the free parameter a. The resulting a values are comparable to those of previous studies of compaction-induced inclination shallowing, both from laboratory experiments and Plio- Pleistocene DSDP sediments. Values of the parameter a suggest that it might be controlled by sediment lithology with greater shallowing for clayey sediments than in calcareous sediments. The apparent predictability of the parameter a offers the hope for restoring shallow inclinations when sediment compaction is known.