[EE] Eveningポスター発表 | セッション記号 S (固体地球科学) | S-IT 地球内部科学・地球惑星テクトニクス

[S-IT22]核-マントルの相互作用と共進化

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近年の高圧実験の進歩で、地球中心部に至る温度圧力条件での鉱物の物性測定が可能となってきた。一方、高精度な古地磁気測定、地球物理学観測、精密地球物理学分析、地球ニュートリノによる地球深部放射性物質の直接観測などの発展と共に、マントル対流や地磁気ダイナモの数値シミュレーション技術も大きく発展して、地球内部の状態の理解が進んできた。本セッションでは、地球及び惑星における核ーマントル相互作用と進化に焦点をあてた、様々な研究分野の成果を一堂に会する機会を提供し、情報交換を進めることを目的とする。また本年度は、SGEPSSの地磁気・古地磁気・岩石学分科会との共催とし、古地磁気測定やダイナモシミュレーションと地球深部物性測定の関連についての投稿も歓迎する。

[SIT22-P29]Rock-magnetic properties of single zircon crystals sampled from the Yangtze River and the Mississippi River

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キーワード：Zircon、Rock-magnetism、Yangtze river、Mississippi river

Geomagnetic field paleointensity data provide critical information about the thermal evolution of the Earth, and the state of the geomagnetic field is closely related to the surface environment. While it is pivotal to understand the variations in geomagnetic field intensity throughout the history of the Earth, data are still too scarce to resolve billion-year-scale geomagnetic field variation. This is primarily because of the lack of geological samples for older eras, which often result in unsuccessful paleointensity experiments. In this study, we focus on a paleointensity experiment using single zircon crystal. Zircon crystals play an important role in paleomagnetic studies because they have several mineralogical advantages: (1) they commonly occur in crustal rocks, (2) precise age determinations with U–Th–Pb and (U–Th)/He analyses are possible, and (3) they have highly resilient responses to alterations and metamorphism.

In order to evaluate the feasibility of the paleointensity experiment using single zircon crystals, we conducted systematic rock-magnetic measurements for single zircon crystals sampled from the Yangtze River and the Mississippi River. Remanent magnetizations of the single zircon crystals were measured using the superconducting quantum interference device magnetometer. Natural remanent magnetization (NRM) intensity was first measured. Then low-temperature demagnetization (LTD) treatment was further conducted, and the memory (NRM intensity after LTD treatment) was measured. We also carried out alternating field demagnetization (AFD) treatment, and the memory (NRM intensity after AFD treatment) was measured. After the NRM measurements, isothermal remanent magnetization (IRM) was imparted with a field of 1 T using pulse magnetizer, and the resultant IRM intensity was measured. Subsequently, IRM intensity after LTD treatment and AFD treatment were measured. For selected samples, hysteresis loop and low-temperature remanence curves were measured using the alternating gradient magnetometer and the magnetic property measurement system. We will discuss the rock-magnetic properties of single zircon crystal based on the experimental results.