Geodynamics Seminar

第303回ジオダイナミクスセミナー

Parts for modeling the lower mantle: Equation of state and elemental partitioning in Mg-perovskite and magnesiowüstite

Speaker：Yoshinori Tange
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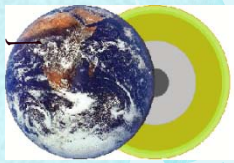
主催：愛媛大学地球深部ダイナミクス研究センター
日時：7/29（金）午後 4時30分～
場所：総合研究棟4F　共通会議室



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Abstract

All the physical property of candidate materials in the inaccessible Earth's interior is investigated to be merged into Earth models. These models are in general separately considered as seismological, thermal, and compositional Earth models. Among these three models, the seismological Earth model is only based on direct observations of the actual Earth's interior, although some physical assumptions are necessary to derive secondary properties such as density. In contrast, the thermal and compositional Earth models are constructed by using mineral physics information of the candidate materials, and the physical properties are also substantial to interpret the seismological Earth model. Especially, *P-V-T* equations of states (EOS) of the materials are one of the most important information, because we can derive density, bulk modulus, thermal expansion coefficient, and so on, as a function of *P* and *T*. These properties are concerned with the three Earth models directly, and thus EOS plays central roles in the Earth modeling. We have tackled with the EOS to make it precise and accurate for a long time, on the basis of static high-pressure experimental techniques using a large volume press and a diamond anvil cell. Recently, we are going to be able to discuss the absolute accuracies of the *P-V-T* EOS and the *P-T* derivatives due to a primary pressure scale based on a specific analytical approach. In the presentation, at first, we represent a recent result of *P-V-T* measurements of $MgSiO_3$ perovskite, which is the most abundant mineral phase in the Earth's mantle, up to 110 GPa and 2500 K by using a sintered-diamond Kawai-type apparatus and a laser heated diamond anvil cell. Second, we will show another recent experimental result about Fe-Mg partitioning in the lower mantle at 50 GPa and 2100 K. Then finally, discuss a current modeling of the lower mantle in the system MgO-FeO-SiO_2 based on the recent results.

詳細は当センターホームページ: http://www.ehime-u.ac.jp/~grc/をご覧ください
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