

# The 436th Geodynamics Seminar

## Technical developments in high temperature generation using multianvil apparatus with sintered diamond anvils

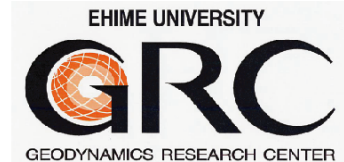
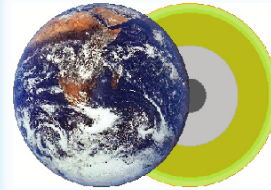
Takeshi Arimoto (Ph.D. student, Ehime University)

Date: 2.5.2016 (Fri) 16:30 ~

Venue: Meeting Room #486, Science Research Bldg 1, Ehime Univ.

日時：2016年2月5日(金)16:30~

場所：愛媛大学 総合研究棟 I  
4階共通会議室



### Abstract

The Kawai-type multianvil apparatus (KMA) using sintered diamond (SD) anvils is a powerful apparatus to provide high pressure and high temperature conditions corresponding to Earth's lower mantle. Recent studies on high pressure generation using SD anvils have expanded experimental pressure conditions, and achieved pressure conditions to lower region of the lower mantle. However, the high temperature generation above pressures of 50 GPa have been quite difficult. In this study, we report recent results in high temperature generation using SD anvils up to mid-lower mantle conditions.

High pressure and high temperature experiments were made at BL04B1 beamline, SPring-8, and geodynamics research center, Ehime University. Two KMA (SPEED-Mk.II and MADONNA II) were used. SD anvils with TEL of 1.5 mm were used. A semi-sintered  $\text{Al}_2\text{O}_3$  corundum (purity 99.99%) were used as a pressure medium. A Ca-doped  $\text{LaCrO}_3$  and a cylindrical Re were used as a heater. We optimized the cell assembly for SD anvils in order to improve the efficiency of pressure and temperature generations, and achieved the maximal pressure to 64 GPa at the load of 6.0 MN. High temperature generation to 2000 K using a  $\text{LaCrO}_3$  heater was made at 59 GPa. In addition, high temperature generation using a Re heater was also conducted up to 57 GPa and 2100 K. The performances of  $\text{LaCrO}_3$  and Re heater were quite stable without any scattering at that pressure region during heating. I will talk about recent results using SD anvils.