

# レーザー衝撃実験によるFe-Si融体の重力不安定性成長のその場観察

## In situ observation of Rayleigh–Taylor instability growth of liquid Fe-Si using laser shock

\*寺崎 英紀<sup>1</sup>、境家 達弘<sup>1</sup>、重森 啓介<sup>2</sup>、加藤 弘樹<sup>2</sup>、弘中 陽一郎<sup>2</sup>、近藤 忠<sup>1</sup>

\*Hidenori Terasaki<sup>1</sup>, Tatsuhiro Sakaiya<sup>1</sup>, Keisuke Shigemori<sup>2</sup>, Hiroki Kato<sup>2</sup>, Yoichiro Hironaka<sup>2</sup>, Tadashi Kondo<sup>1</sup>

1. 大阪大学大学院理学研究科、2. 大阪大学レーザー科学研究所

1. Graduate School of Science, Osaka University, 2. Institute of Laser Engineering, Osaka University

Rayleigh–Taylor instability occurs at the interface between two fluids with different densities when a heavy fluid overlies a light one in a gravitational field. The RT instability is considered as one of the important core formation mechanism beneath the magma ocean. This mechanism has been discussed from simulations (e.g., Honda et al. 1993, Ricard et al. 2009) and analog experiment (e.g., Olson and Weeraratne, 2008). However, experimental approach using liquid Fe-alloys for this mechanism has never been performed under high pressure. In this study, we applied the laser-shock technique to observe *in situ* the Rayleigh–Taylor instability of liquid Fe-Si alloy under high pressure. The growth of the Rayleigh–Taylor instability was successfully observed using *in situ* x-ray radiography under shock compression. The growth rate of the Rayleigh–Taylor instability was estimated to  $0.3 \text{ ns}^{-1}$ . The present results provide useful information to constrain the time scale of the Earth's and planetary core formation.

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