[JJ] Evening Poster | P (Space and Planetary Sciences) | P-PS Planetary Sciences

[P-PS08]Planetary Sciences

convener:Takaya Okamoto(Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency), Kenji Kurosaki(Department of Physics, Nagoya University)
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We call for general interest papers for Planetary Sciences. Planetary Sciences consist of a variety of studies on the past, present, and future of our solar system and exoplanetary systems. Discussions based on various backgrounds are encouraged.

[PPS08-P03]Ejecta Deposit in Indochina Peninsula Formed by the Australasian Tektite Event

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Field observation of craters and ejecta layers on the Earth formed by extraterrestrial impacts is complementary to the studies based on numerical simulation and experiments of impact cratering. However, to conduct field observational studies on impact events on the Earth is difficult because craters and ejecta layers are easy to be erased over time by weathering, erosion, burial and/or subduction of tectonic plates. For this reason, field observation approach has been effective only for young and relatively small impact events, such as Ries crater and Meteor crater, excluding one example of the detailed survey of the Chicxulub impact at the end of the Cretaceous period.

In this context, the Australasian Tektite Event (ca.0.79 Ma) is important because it is the youngest among large (the estimated diameter of the projectile is over a few kilometers) impact events on the Earth. It is expected that the evidence of the impact and its environmental perturbation has been preserved. The large magnitude of the impact is implied from the widespread distribution of Australasian Tektites covering one-tenth of the Earth’s surface and extending from southeastern Asia to Antarctica. The mystery concerning this impact event is that the impact crater has not been found yet, although it is suggested that the impact has taken place somewhere in the eastern part of Indochina Peninsula. Hence, the nature of the impact, such as the location, mode and released energy, is not well understood.

For precise estimation of the location of the impact, distribution of the ejecta layer would be important since a thickness of an ejecta layer decreases with distance from the impact site. The ejecta layer formed by the Australasian Tektite Event, however, has not been identified with confidence on Indochina Peninsula. In order to identify and describe the ejecta layer and to investigate its distribution, we conducted field survey in northeastern Thailand and central Vietnam. In the shallow subsurface of the study area, pebble or gravely silt layer of several tens of centimeters to several meters in thickness containing tektites and overlying silt to fine sand layer of several meters in thickness are widely distributed. For instance, at Huai Om section in Thailand located near the border between Thailand and Lao, the basement rock of Cretaceous sandstone is covered by gravely silt layer (ca. 2 m in thickness) and an overlying massive fine sand layer (ca. 3 m in thickness). The observation of constituent particles

of the deposit under a polarizing microscope reveals that the deposit at Huai Om section contains shocked quartz grains, which are the most diagnostic evidence of shock metamorphism. Shocked quartz grains are identified by measuring orientations of lamellae in quartz grains using a universal stage. Based on the presence of tektites and shocked quartz, the deposit at Huai Om section is considered to be the ejecta deposit. Shocked quartz grains are also found from other study sites. The thickness of the pebble or gravely silt layer tends to decrease with distance from the southern part of the border between Thailand and Lao. It implies that the location of the impact is near this area. Further studies of the distribution of the thickness of the ejecta deposit and the size and percentage of shocked quartz in the ejecta deposit are needed to constrain the location of the impact.