Dredge cruise on petit-spot volcanoes and IODP drilling earth science -Great discovery : explosion crater (Maar) in the abyssal plane, off Tohoku-

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The R/V (Research Vessel) Shinsei Maru Cruise KS-18-19 was performed during 10 days from Thursday, August 2, 2018 (Ishinomaki, Miyagi) to , Saturday, August 11, 2018 (Ishinomaki, Miyagi) in the off Tohoku area about 350km east, and was conducted by the chief scientist: Dr. Naoto Hirano (Tohoku University) together with total 12 onboard scientists. The research title is “Distribution of petit-spot submarine volcanoes along the deformation of tectonic plate” which was selected by the Cooperative Research System of the R/V Shinsei Maru, Atmosphere and Ocean Research Institute (AORI), The University of Tokyo. The main research objectives are recovering the igneous rocks from petit-spot volcano, of which magmas originate from the asthenosphere (ductile part of the mantle) immediately below the Pacific Plate with about 70km thick, and assent directly from the deep without petrological change. Research days became less than half, because of escaping from the Typhoon 13, 2018, only 5 times (one with deep sea camera) of dredge hauls were performed to recover igneous rocks, at atop the outer-rise of the Pacific Plate, off Fukushima, NE Japan. Onboard as well as sub-bottom geological and geophysical several observations (ADCP, SBP, MBES, etc.) were also successfully done during the Cruise. Research summaries are shown in the followings:①recovering the very young igneous rocks from three petit-spot volcanoes, originate from the asthenosphere, ② recovering ferromanganese crust related with hydrothermal activity of petit-spot volcanoes, ③ discovery of the petit-spot volcano with explosion crater (=Maar) in the ocean floor about 5500m deep.

New scientific concepts of (A) the petit-spot’s magmas originate from the asthenosphere and (B) the magmas made deep sea explosion crater (=Maar) are great discovery in the earth science (like the Chibanian?) originated from Japan. The concepts will encourage Japanese young geoscientists. The petit-spot volcanoes are the most important scientific target of IODP.

Keywords: explosion crater (=maar) in the deep ocean floor, “petit-spot” volcano, “petit-spot” magma originate from the asthenosphere, outer-rise off Tohoku, ferromanganese crust related “petit-spot” volcanoes, IODP drilling earth science

