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Development of New Sampling Devices for Solar System Small Body Sample Return Program in the Hayabusa Era

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<http://planetb.sci.isas.jaxa.jp/flab/>

Following up the Hayabusa mission to the S-type asteroid Itokawa, Japan is aiming for establishing a new exploration program series of sample return missions from more primitive small bodies such as C-type asteroids, comet-asteroid transition objects, and D- and P-type asteroids, at which one can expect both organic and hydrated minerals to unveil the origin and chemical evolution of life precursors and extraterrestrial waters.

By taking the most advantage of new asteroid science results, technology verification and invaluable operation experiences through the Hayabusa mission, its immediate follow-up mission 'Hayabusa-2' around 2010 is preparing for an impact sampling device modified for more porous C-type asteroids than S-type by developing new projector and projectile systems to increase sample yield.

As for the next generation spacecraft nicknamed 'Hayabusa Mk-II' with fully new system design in mid-2010's, impact double-wall coring projectiles with a retractable tether system is the first step option under the development for stratigraphic collection of both surface and sub-surface samples from the most primitive samples of the solar system small bodies.

This talk will summarize current status of development of these new sampling systems for the upcoming solar system small body exploration program in Japan's post-Hayabusa era.