Spectroscopic, spectrophotometric, and periodic observations for low delta-v near-Earth asteroids

*Sunao Hasegawa[1], Daisuke Kuroda[2], Kohei Kitazato[3], Toshinori Kasuga[4], Naruhisa Takato[2], Kentaro Aoki[2], Akira Arai[5], Tetsuharu Fuse[6], Takashi Hattori[2], Hidekazu Hanayama[2], Yang Hongu[7], Nobunari Kashikawa[2], Kyoko Kawakami[8], Daisuke Kinoshita[9], Shogo Nagayama[2], Setsuko Nishihara[8], Yohei Ohba[8], Yoichi Oyama[10], Yuki Sarugaku[5], Tomohiko Sekiguchi[11], Yasuhiro Shimizu[2], Yuhei Takagi[2], Jun Takahashi[12], Hiroyuki Toda[2], Fumihiko Usui[13], Makoto Watanabe[14], Kenshi Yanagisawa[2], Michitoshi Yoshida[2], Masanao Abe[2], Masateru Ishiguro[7]

1. Japan Aerospace Exploration Agency, 2. National Astronomical Observatory of Japan, 3. University of Aizu, 4. Kyoto University, 5. Kyoto Sangyo University, 6. National Institute of Information and Communications Technology, 7. Seoul National University, 8. University of Tokyo, 9. National Central University, 10. Academia Sinica Institute of Astronomy and Astrophysics, 11. Hokkaido University of Education, 12. University of Hyogo, 13. Kobe University, 14. Okayama University of Science

Hayabusa (MUSES-C) conducted sample return mission from the near-Earth asteroid 25143 Itokawa (1998 SF_{36}), and Hayabusa2 is under exploration to the near-Earth asteroid 162173 Ryugu (1999 JU_3).
It is indispensable to select candidate small bodies that will be the exploration and to know their physical characteristics in advance.
Before Hayabusa launched, we have done physical observation of candidate prospecting for asteroid exploration mission (Abe+2000, Ishibashi+2000a, +2000b, Ishiguro+2003, Kaasalainen+2003, Ohba+2003, Sekiguchi+2003, Cellino+2005, Lederer+2005, Nishihara+in-press, Müller+2005, Müller+2007, Hasegwa+2008, Müller+2011, Urakawa+2011, Kim+2013, Kuroda+2014, Ishiguro+2014, Müller+2014, Müller+2017, Perna+2017).
Currently, Hayabusa2 has already been launched, and the asteroid to be explored are determined to be the C-complex asteroid 162173 Ryugu.
For this reason, the observation for searching for a candidate for exploration candidate is now finished.
Therefore, we report on the physical properties of observed asteroids (5 Spectroscopic, 26 spectrophotometric, and 32 periodic observations) for the information of future exploration.

Keywords: asteroids, observations

