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The Hayabusa asteroidal sample return mission of JAXA: mineralogy and crystallography of some Itokawa particles

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Itokawa particles returned by the JAXA Hayabusa spacecraft are providing significant information about the formation and evolution of meteorite parent bodies [1]. The preliminary examination (PE) of these particles revealed that their mineral compositions are close to those of equilibrated LL chondrites [2]. Here we report mineralogical and crystallographic studies on 4 new (RA-QD02-0179, 0138, 0100, and 0133-01) and 3 PE (RA-QD02-0036, 0041 and 0049-2) particles that were allocated by JAXA within an international AO study (1). The newly-analyzed particles are all compositionally close to equilibrated LL chondrites. Because the plagioclase crystallite size is larger than 2 μm, the petrologic type is ≥5. Thus, this study further confirms that the Itokawa particles belong to equilibrated LL chondrites with minor shock metamorphism. References: [1] Nagao K. et al. 2011. *Science* 333:1128–1131. [2] Nakamura T. et al. 2011. *Science* 333:1113–1116.

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