



Integrated Sampler Downhole Hammering Drill Head (ISDHH) for soft and hard soil sampling

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A novel kind of planetary drill head was developed for deep soil sampling of soft sand or hard rocks. The mechanism consists of a hammering head to be mounted on the end of a long drill string in order to assist the penetration into deep layers of planetary surfaces. A sampling tool, with a low drill to sample ratio, is integrated into the head. This sampling tool can be hammered separately from the main drill head into hard rock for sampling. Necessary energy and thermo effects on the sample are thus reduced. A shutter mechanism which is implemented into the sampling device can either scribe hard rock cores or can be used to retrieve fine sand samples.

This paper will present the different features of this tool which was developed to address the challenging missions for planetary exploration like the forthcoming robotic exploration plans for Mars by the European Space Agency and for the Moon by the Chinese Space Agency. The conceptual development of the ISDHH and preliminary tests results will be presented.