

Abstract Submitted  
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**Using instrumented particles for coarse sediment entrainment studies** KHALDOON AL-OBAIDI, MANOUSOS VALYRAKIS, University of Glasgow — Sediment transport processes shaping Earth’s surface are important to study and find a range of applications across fields including environmental fluid dynamics and geomorphology. This work introduces an accessible and low cost approach for assessing the initiation of sediment entrainment, a major challenge for earth surface scientists and hydraulic engineering. Specifically, a miniaturized instrumented particle of 3cm in diameter is used for the direct monitoring of destabilisation potential of an open channel flow bed surface comprising of uniform coarse particles [1]. The instrumented particle has been calibrated and used to investigate its probability of entrainment due to turbulent flows, by assessing its entrainment frequency and magnitude, using the logged readings. These are also linked to near bed surface flow hydrodynamics [2,3]. References [1] Al-Obaidi, K.; Xu, Y.; Valyrakis, M. (2020). The Design and Calibration of Instrumented Particles for Assessing Water Infrastructure Hazards, *J. Sens. Actuator Netw.* **2020**, 9, 3, 36, 1-18, <https://doi.org/10.3390/jsan9030036>. [2] Valyrakis, M.; Diplas, P.; Dancey, C.L. Entrainment of coarse particles in turbulent flows: An energy approach. *J. Geophys. Res. Earth Surf.* **2013**, 118, 42–53, doi:10.1029/2012JF00235. [3] Pähtz, T.; Clark, A. H.; Valyrakis, M.; Duran, O. The Physics of Sediment Transport Initiation, Cessation, and Entrainment Across Aeolian and Fluvial Environments. *Rev. Geophys.* **2020**, 58, 1, 1-58, doi:10.1029/2019RG000679.

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