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## Video-Imagery Analysis of Aeolian Sand Transport over a Beach

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Sand transport by wind displays dynamic structure and organisation in the form of streamers (aka 'sand snakes') that appear, meander and intertwine, and then dissipate as they are advected downwind. These patterns of saltating grain populations are thought to be initiated and controlled by eddies in the turbulent boundary layer airflow that scrape over the bed surface raking up sand into entrainment. Streamer behaviour is thus fundamental to understanding sand transport dynamics, in particular its strong spatio-temporal variability, and is equally relevant to granular transport in other geophysical flows (fluvial, submarine).

This paper presents findings on sand transport rates and streamer dynamics observed in a field experiment on a beach, by analysing imagery from 30Hz video footage, combined with 50Hz sand transport data from laser particle counters ('Wenglors'), all taking place over an area of  $\sim 10 \text{ m}^2$  and over periods of several minutes.

Mapping of streamers and saltation cloud density is compared with fluctuations in sand transport rate measured at the Wenglors. Large-Scale Particle Image Velocimetry (LSPIV) is applied to determine advection vectors that can be matched against in-situ measurements of airflow and sand transport. Analysing video-imagery of aeolian sand transport faces several challenges, however, most notably the difficulties of background subtraction to differentiate the moving streamers from the underlying beach surface.