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## **Illuminating the speed of sand – quantifying sediment transport using optically stimulated luminescence**

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Sediment burial dating using optically stimulated luminescence (OSL) is a well-established tool in geochronology. Yet, an important prerequisite for its successful application is that the OSL signal is sufficiently reset prior to deposition. However, subaqueous bleaching conditions are vastly understudied, for example the effect of turbidity and sediment mixing on luminescence bleaching rates is only poorly established. The possibility that slow bleaching rates may dominate in certain transport conditions led to the concept that OSL could be used to derive sediment transport histories. The feasibility of this concept is still to be demonstrated and experimental setups to be tested. Our contribution to this scientific challenge involves subaquatic bleaching experiments, in which we suspend saturated coastal sand of Miocene age in a circular flume and illuminate for discrete time intervals with natural light. We further record the in-situ energy flux density received by the suspended grains in the UV-NIR frequency range by using a broadband spectrometer with a submersible probe.

Our analysis includes pre-profiling of each sample following a polymineral multiple signal protocol (Reimann et al., 2015), in which we simultaneously measured the quartz dominated blue stimulated luminescence signal at 125°C (BSL-125) and the K-feldspar dominated post-infrared infrared stimulated luminescence signal at 155°C (pIRIR-155). Preliminary results from the flume experiments show that the bleaching rates are indeed slow, differ for both signals and that the pIRIR155 seem to bleach faster than the BSL125. Besides the good prospects of acquiring a new tool for quantifying sediment transport, these results might have potentially far-reaching implications regarding the preferred target mineral for OSL dating in fluvial settings.