



## **Importance of particle shape in DNS of sediment transport**

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Recently conducted Direct Numerical Simulations (DNS) of the sediment transport has provided important insights into the phenomenon such as particle erosion and clustering. However, most of these studies represent the sediment particles as spheres. This reduces the numerical efforts but implies simplification of physics. The present study quantifies the effect of particle shape on sediment motion as well as fluid turbulence. Four simulations with different particle shapes (sphere, prolate, oblate, triaxial-ellipsoid) were conducted. All the parameters such as Reynolds number, void fraction, Shields number were kept constant. The results feature increased Reynolds stresses in case of oblate particles, though the main difference remains in the particle statistics. On the one side, oblate and prolate particles stay near the sediment bed exhibiting sliding motion, and on the other side, spherical particles preferentially roll and jump. Triaxial-ellipsoids, better representation of river grains, behave in between these two extreme cases.