126th MSS-Seminar
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Seminarraum (00.156),
Cauerstraße 3, Erlangen.

Drag force acting on an intruder moving through a light granular material

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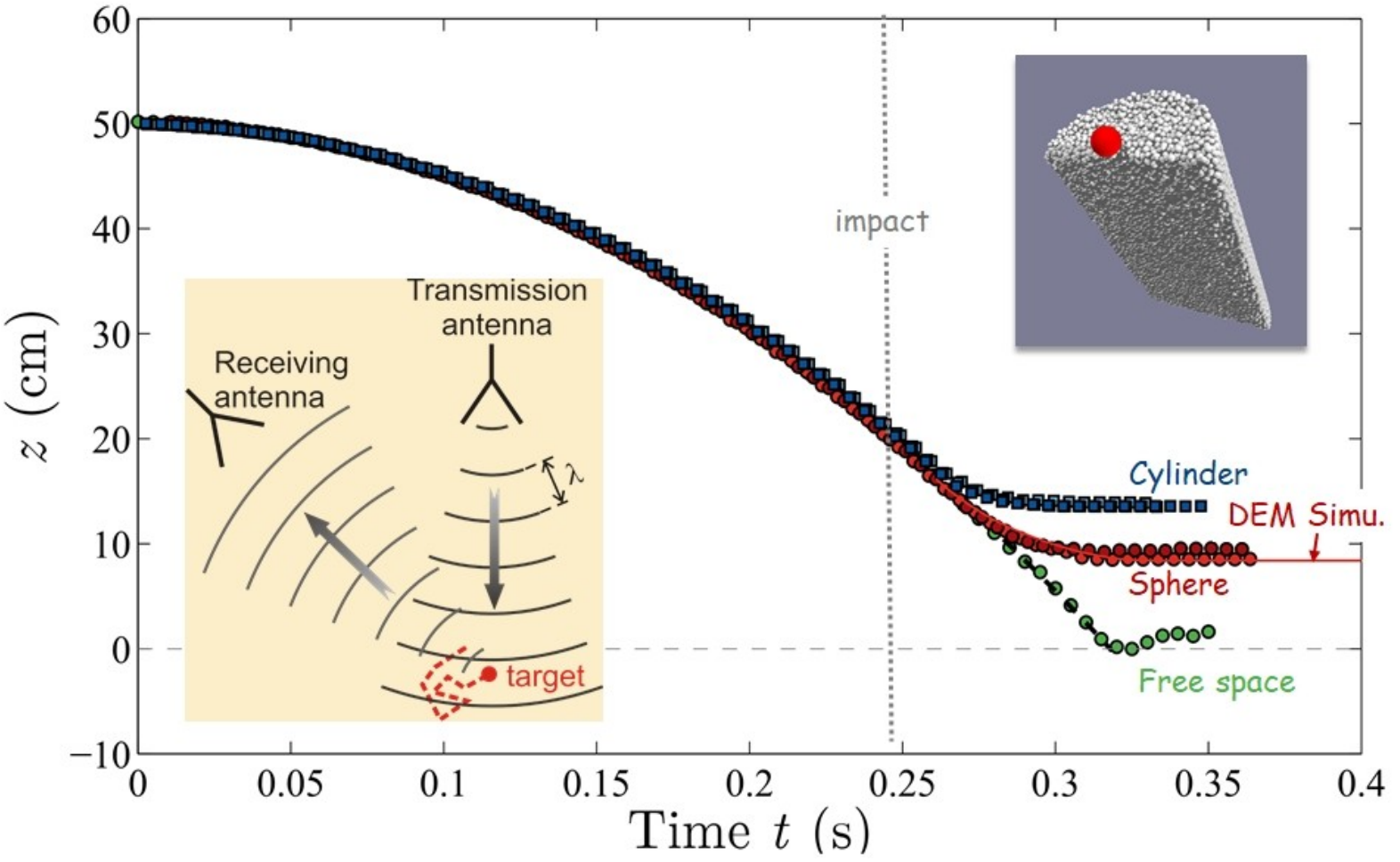

In this work, we study experimentally and numerically the penetration of a spherical intruder in a granular bed, varying the impact velocity. We employ a recently developed microwave radar system, which allows tracking the intruder movement through styrofoam particles accurately. We also perform discrete element simulation and use coarse-graining techniques, which allow addressing both the dynamic of the intruder and the response of the granular bed. For low impact velocity, we f nd that the cavity smoothly collapses, after the intruder penetrates the bed. For high initial speeds, however, the evolution of the cavity radius is much faster, and it diminishes practically by a jump, which is often determined by the movement of a single particle. From our data, we f nd that the length scale of the energy dissipation is in the order of magnitude of the intruder size, which is in agreement with the long-scale inertial dissipation type that we find in all cases.