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Experimental investigation of the flow field and pollen trajectories/deposition around ovulate pine cones NETA-LEE JACOBSON, RENÉ VAN HOUT, Faculty of Mechanical Engineering, Technion - Israel Institute of Technology — Particle deposition on bluff bodies is important both in industrial applications as well as in furthering our understanding of ecological networks. It has been hypothesized that plant structural morphology manipulates the flow field in order to enhance capturing of species-specific pollen and thereby increase fertilization chances. Here, the deposition mechanism of different pine pollen on freshly harvested ovulate pine cones (*Pinus Halepensis/Brutia*) was investigated using high speed, planar particle image velocimetry and holographic 3D technique enabling measurement of both Lagrangian particle tracks and instantaneous flow fields. Measurements were performed in a small blow–through windtunnel at Reynolds numbers ranging from Re = 174 to 767. The roughness on a pine cone is characterized by "scales" organized as Fibonacci spirals. Effects of this roughness on the flow field are compared to results for a smooth sphere at similar Re. Particle deposition results indicate that inertial deposition on the windward side of the cone is the main mechanism. However, at the lowest Reynolds numbers pollen with Stokes numbers less than one were entrained into the cone's near wake and advected towards the leeward side of the cone.

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