

Exploration of the role of porosity on the flow past a sphere

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The flow past a sphere is a classical problem in fluid dynamics. However, despite years of study, this flow remains an elusive topic to fully understand, especially at high Reynolds numbers. Adding additional complexity, such as roughness or porosity, further complicates our understanding of how the fluid flow will interact with our object. Inspired by the flow past a dandelion seed head (Fig. 1), we seek to elucidate the role of porosity on the flow around a sphere. To do this, we created hollow model spheres with varying porosity. The flow past these spheres is examined to determine the role of porosity on wake size and the separation point at various Reynolds numbers.

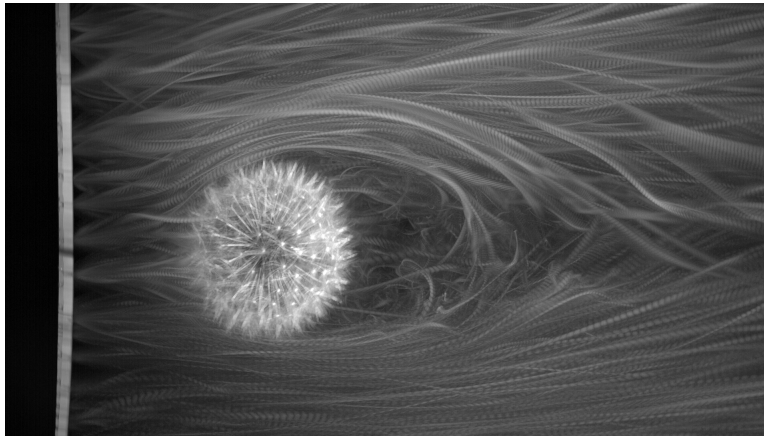


Figure 1: Smoke wire visualization of flow past a dandelion seed head.