

## Dynamics of Janus-like Swimmers in Millimeter Scale

Anjuman Ara Khatun, Ratan Sarkar, Pampa Dey, P. Parmananda, Snigdha  
Rani Panda and Sunita Srivastava

*Indian Institute of Technology Bombay, Mumbai, India*

Janus particles are micro/nanoparticles with different surface properties, named after the two-faced Roman god Janus. In the present study, we perform tabletop experiments to investigate the dynamics of cylindrical shaped Janus-like swimmers in the millimeter scale. This Janus-like cylinder is characterized by a phase separation along the minor axis into two cylinders of distinct faces whose one part is active and other part is passive. We observe that when an active Janus-like swimmer is placed on the surface of the DI water it experiences self-propulsion and rotational motion caused by the Marangoni-force on the air-water interface. By measuring the mean square displacement and their displacement probability distribution, it is identified that the swimmer shows two-stage self-propulsion behavior. Furthermore, the rotational motion of the Janus-like swimmer is characterized by the mean square angular displacement and the rotational diffusion coefficient. These results show that particle's rotational motion dominates the translational motion. Finally, the effect of length and surface properties of these swimmers are analyzed.

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