

## Observation of Laminar to Turbulent Transition in Micro-Propellers

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**Abstract :** Micro-propellers can operate in regimes of small Reynolds numbers where the effect of viscous friction becomes important. In this work, the transition from laminar to turbulent regime in micro-propellers driven by electric motors was observed. The analysis revealed that the lift force was linearly proportional to propeller output power when systems operate in the laminar/viscous regime, while a sublinear relation between the force and the output power was observed in the turbulent/inertial regime. These behaviors appeared to be independent of motor-propeller specifications. The Reynolds number that marks the regime transition was found to be at around 10000.

**Keywords :** UAV, micro-propeller, laminar-turbulent, Reynolds number

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