

Abstract Submitted
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Potential Flow Model for Wall Effects on Quadrotor UAVs¹ DIMITRI CALOMIRIS, JOVAN NEDIC, McGill University — Solid surfaces are known to directly influence the flow surrounding propellers when they are close to each other by altering the thrust force. One of the most common potential flow models, developed by Cheeseman and Bennett, predicts the relative increase of a rotor's thrust as a function of ground distance (for constant power operation), within four rotor radii (*i.e.* in ground effect). Recently, Sanchez-Cuevas *et al.* extended this single propeller model to a quadrotor, which experiences a much larger influence from the ground. However, no such characterization has been done for walls. A potential flow model to account for wall effects will be presented and the results compared to experimental data. Initial measurements have qualitatively shown that the presence of the wall causes the quadrotor UAV to pitch down, essentially flipping it into the wall.

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