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# A Quadcopter Stability Analysis: A Case Study Using Simulation

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**Abstract :** This paper aims to present a study, with the theoretical concepts and applications of the Quadcopter, using the MATLAB simulator. In order to use this tool, the study of the stability of the drone through a Proportional - Integral - Derivative (PID) controller will be presented. After the stability study, some tests are done on the simulator and its results will be presented. From the mathematical model, it is possible to find the Newton-Euler angles, so that it is possible to stabilize the quadcopter in a certain position in the air, starting from the ground. In order to understand the impact of the controllers gain values on the stabilization of the Euler-Newton angles, three conditions will be tested with different controller gain values.

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