

FIXED AND ROTARY WING FLIGHT OF SMALL AIR VEHICLES ON MARS, VENUS, AND TITAN.
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Fixed and rotary wing air vehicles provide mobility and an ability to position sensors that is not practicable with orbiting and ground-based systems. Furthermore it is feasible to employ air vehicles for the exploration of the surfaces of Mars, Venus and Titan [1-5].

Mission objectives and available technology (e.g., sensors, motors, comms, materials, algorithms, energy storage, and aerodynamics) continually evolve so the air vehicle design space is revisited with each new proposed mission concept.

This presentation discusses three air vehicle concepts from recently proposed missions to Mars, Venus and Titan with an emphasis on air vehicle performance considerations. We begin with a comparison of the key planetary and atmospheric properties influencing air vehicle aerodynamics and highlight associated benefits and challenges. Top level mission descriptions are presented and we show how each air vehicle concept addresses the concept goals.

References: [1] Wright H.S., et al. (2004) *SPIE's 4th International Asia-Pacific Symposium on Remote Sensing of the Atmosphere, Ocean, Environment, and Space*. [2] Young L.A., et al. (2002) *IEEE Aerospace Conference*. [3] Colozza A., Landis G., and Lyons C. (2003) *AIAA International Air and Space Symposium and Exposition*. [4] Cutts J.A., et al. (1999) *AIAA Balloon Technology Conference*. [5] Landis G.A., Colozza A., LaMarre C.M.(2002) *AIAA-2002-0819*.