

Magnetic-Sails vs Two-Stage Fusion Rockets for Sub-Century Missions to Alpha Centauri

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Magnetic Sails are a possible non-propellant means of braking interstellar vehicles against the Interstellar Medium. To explore their utility a variety of scenarios are explored, using as a baseline the performance and stage-mass relationships of the “Project Daedalus” two-stage interstellar vehicle, using original and updated fusion physics values. For comparison purposes, the measured ion density of the interstellar medium between Sol and Alpha Centauri, 10^5 , and a magnetic-sail mass of approximately 1,000 tonnes are assumed and compared against a purely fusion propelled two-stage configuration for braking “Project Daedalus” class payloads of 450 tons for total mission times of less than a century to Alpha Centauri.