Abstract Submitted
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Waveguide Pellet Accelerator[1] P.B. PARKS, R.W. CALLIS, General Atomics — DT fuel pellets placed in a straight ($\sim$1 m) section of a waveguide can be accelerated to high velocity (>3 km/s) by using millimeter microwave power to vaporize a composite "pusher medium" and convert it to high-pressure propellant gas [1]. Wave absorption in the pusher medium occurs by joule dissipation of eddy currents induced in micron sized conducting particles (Li, Be) uniformly dispersed in a slug of solid D_2 between the fixed window and the DT pellet. Formulae are derived for the absorption coefficient of waves propagating through the pusher medium in rectangular and circular waveguides. The wave damping distance elongates exactly in proportion to the length of the propellant gas, such that wave absorption remains constant in time. As the absorption coefficient doesn't depend on the wave power, a bench test experiment utilizing small-signal microwaves can be used to measure the absorption coefficient of the TE_{01} mode in a cylindrical waveguide for combinations of absorber species and host media. Results are compared with theoretical predictions.

[1] P.B. Parks and F.W. Perkins, Nucl. Fusion **46** (2006) 770.

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