Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

**High-gain aneutronic fusion**[1] M.J. HAY, N.J. FISCH, Princeton University — Fusion reactions which release most of their energy in charged particles are desirable for power applications. The proton-boron reaction $p+^{11}B \rightarrow 3\alpha+8.7\,\mathrm{MeV}$ is ideal due to the low incidence of neutron-generating side reactions and the natural abundance of the reactants. However, an optically thin proton-boron plasma radiates a substantial amount of energy via bremsstrahlung. To compensate, we consider ways of increasing the fusion reactivity above the Maxwellian value. Using the fusion alpha particle energy to heat specific parts of the proton velocity distribution is one such approach. In principle, waves could channel the alpha energy to protons near the cross section maximum in energy, resulting in a substantial reactivity gain. By making aggressive assumptions regarding how energy might be channeled, we present upper bounds on the extent to which a proton-boron fusion reaction can be self-sustaining.

[1]Work supported by DOE Contract No. DE-AC02-09CH11466 and DOE NNSA SSAA Grant No. DE274-FG52-08NA28553. M. J. H. was supported in part by the DOE NNSA SSGF under Grant No. DE-FC52-08NA28752.

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Date submitted: 10 Jul 2014 Electronic form version 1.4