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Efficiency of a Traveling Wave Direct Energy Converter with High-Density Beam for Applications to Aneutronic Fusion Experiments ALFONSO TARDITI, Electrical Power Research Institute, Knoxville, TN — Due to the appeal of aneutronic fusion, a variety of reactor concepts have been proposed in past. In most cases, to achieve a positive net power balance these reactor concepts rely on a significant re-circulation of the energy produced to maintain a non-equilibrium configuration (unlike ignited plasmas). The availability of a direct conversion process with high efficiency is then critical for determining the feasibility of a reactor (particularly when the "almost true aneutronic" reaction like $p-^{11}B$ is considered). A Traveling Wave Direct Energy Converter (TWDEC, [1]) is considered for the energy conversion of a high-density beam formed by the fusion products (MeV-range α-particles). As in [2], a PIC code is utilized for a realistic beam model. The study is focused on the possibility of obtaining high-efficiency coupling between a modulated high-density "bunched" beam, accounting also for a neutralizing electron environment, and the TWDEC electrode collector structure.

[1] Momota *et al.* (1999) Fus. Tech., 35, 60
[2] Y.Yasaka *et al.* (2009), Nucl. Fus., 49, 075009

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