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Two dimensional (r-theta) transport model for synchrotron radiation of FRC plasma ARTAN QERUSHI, DAN BARNES, TriAlpha Energy Inc., THE TAE TEAM — A two dimensional (r-theta) transport model has been developed for describing the power loss in FRC reactor plasmas and the transport of energy due to synchrotron radiation as well as the transport of energy due to synchrotron radiation. The transport model uses 1d FRC equilibrium profiles [1] and solves the equation of radiative transfer in two dimensions (r-theta) taking into account the absorption and emission of synchrotron radiation. Relativistic expressions are used for both the absorption and the emission coefficients of synchrotron radiation. The reflection of synchrotron radiation from metal walls is taken into account using the approach of Krajcik [2]. The results of the two-dimensional calculations are compared with simpler 1d calculations, which use an approach developed by Dawson [3] and Berk *et al.* [4], and 0d calculations which use an approach developed by Trubnikov.

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[2] R. A. Krajcik, The effect of a metallic reflector upon cyclotron radiation, Nucl. Fusion **13**, 7-16, 1973.
[3] J. M. Dawson, "Advanced Fusion Reactors" in Fusion (Academic, New York, 1981), Vol. 1, Part B, page 453.
[4] H. L. Berk, H. Momota and T. Tajima, Plasma current sustained by fusion charged particles in a Field Reversed Configuration, Phys. Fluids **30**, 3548-3565 (1987).

Artan Qerushi
TriAlpha Energy Inc.

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