Abstract Submitted
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**Rapid estimates of plasma emission spectra from any atomic species** DAVID SMITH, TIM SOMMERER, GE Research, USA — A method has been developed and implemented to provide rapid estimates of emission spectra from plasmas in atomic gases. Results from these calculations have been validated against experimental data for species with both sparse (Sn) and dense (Zr) emission spectra. The calculation relies on two profound assumptions on the atomic-plasma kinetics, namely a modified Boltzmann distribution of the excited-state densities accounting for a non-Maxwellian distribution, and a general expression for radiation trapping. The atomic density and excitation temperature are the input variables; the excitation temperature includes an additional scaling function to simulate the inelastic depletion of high-energy electrons. The model has been applied to identify Sb, Ge, Ga, Sn, Pt, and Mg as the most promising atoms for germicidal sources (excluding Hg). Additionally it has used to select species and gas phase densities of additives to avoid arc constriction in plasmas where most of the radiation comes from atoms with dense emission spectra.

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