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RF Plasma Synthesis: A Novel Technique for Preparation of High Critical Field "Dirty" MgB_2 MOHIT BHATIA, Accelerator Technology Corp., College Station, TX 77845, TIM ELLIOTT, PETER MCINTYRE, AKHDIYOR SATTAROV, Department of Physics, Texas A&M University, College Station, TX 77843 — It has been shown, both theoretically as well as experimentally, that very high critical fields can be achieved in "dirty" MgB_2 superconductors. However, controlled homogeneous doping/alloying has thus far remained a challenge. A novel technique of rf plasma sputtering of "dirty" MgB_2 is hence being developed. This technique promises a potential for the synthesis of powders with homogeneous doping/alloying in the crystal lattice. Spatial temperature profile in the plasma plume is helpful, especially for the case of MgB_2 where the reacting species have very different vaporizing temperatures. Details of the design concept and preliminary results will be presented.

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