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Mapping microwave fields using the spin Hall effect¹ VINCENT VLAMINCK, Materials Science Division, Argonne National Laboratory, HEL-MUT SCHULTHEISS, JOHN PEARSON, FRANK FRADIN, SAMUEL BADER², AXEL HOFFMANN, Argonne National Laboratory — We present measurements of the spatial variation of the spin pumping - inverse spin Hall effect in a palladium/permalloy bilayer via a coplanar waveguide ferromagnetic resonance (CPW-FMR) broadband technique. We show that the inverse spin Hall signal is both inhomogeneous and asymmetric with respect to both the position along the CPW and the excitation port. These frequency dependent asymmetries in the measured voltage are most likely due to an impedance mismatch at the contact points and the asymmetry between the two ends of the CPW. Based on this observation we show how the inverse spin Hall effect can be used as a sensitive probe for mapping the microwave magnetic field distribution in the FMR frequency range. This work emphasizes the importance of characterizing the microwave field homogeneity in every experiment with extended samples.

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