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Role of contact resistance in the effective spin relaxation rate in graphene spin valves[1] GORDON STECKLEIN, YOSKA ANUGRAH, JING LI, STEVEN J. KOESTER, PAUL CROWELL, University of Minnesota — Recent experiments (Maassen et al., PRB **86** 235408 (2012), Idzuchi et al., PRB **91** 241407(R) (2015)) have identified the role of finite contact resistances in determining the spin lifetime in graphene based on Hanle measurements of lateral spin valves. We have investigated this effect in spin valves fabricated using Co/AlOx tunnel barriers and graphene grown by chemical vapor deposition. By carrying out non-local spin valve and Hanle measurements over a wide range of gate voltages, we observe a variation in the spin signal that can be explained by the role of the contacts. Using the measured interface resistance, we quantify the degree of contact-induced spin sinking as the ratio of the contact resistance to the channel spin resistance and show that the variation in spin signal is explained by variation in this spin sinking parameter. By properly accounting for the effect of the contact resistance, we measure a spin lifetime that varies between 150-500 picoseconds.

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