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A stable path to ferromagnetic hydrogenated-graphene growth¹ SHAYAN HEMMATIYAN, Department of Physics, Texas A&M University, College Station, TX 77843-4242, USA, MARCO POLINI, NEST, Istituto Nanoscienze -CNR and Scuola Normale Superiore, I-56126 Pisa, Italy, ALLAN H. MACDONALD, Department of Physics, University of Texas at Austin, Austin, Texas 78712-1081, USA, JAIRO SINOVA, Dept of Physics, Texas A&M University, College Station, TX 77843-4242, USA- Institut für Physik, Johannes Gutenberg Universität Mainz Staudinger — Based upon first principle calculations, we present results that indicate the presence of a preferential site on one sublattice for hydrogen adsorption due to the screening effect of hexagonal boron nitride (h-BN). Our results show the effect of h-BN increases the hydrogen migration barrier on top of graphene. We propose a functional heterostructure as a TMR device, which is exploiting the screening effect caused by h-BN and the insulating properties of this exotic 2-D material. The density of states (DOS) calculations, with 1, 2 and 3 h-BN layers sandwiched in between two layers of graphone, show a half metallic state for these new heterostructures.

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