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Dependence of Exchange Bias on Interfacial and Bulk Antiferromagnetic Spins[1] ALI C. BASARAN, THOMAS SAERBECK, JOSE DE LA VENTA, Univ of California - San Diego, HENNING HUCKFELDT, ARNO EHRESMANN, Univ of Kassel, IVAN K. SCHULLER, Univ of California - San Diego — One of the key issues in exchange bias is the dependence of pinned interfacial or bulk uncompensated antiferromagnetic spins. To address this important issue, we grew simultaneously several sets of ferromagnetic/antiferromagnetic (Ni/FeF_2) bilayers capped with a nonmagnetic and inert gold layer of varying thickness. He-ion irradiation was employed to selectively create defects near the Ni/FeF_2 interface or in the bulk of FeF_2. The penetration depth of the ions with constant energy and dose was controlled by the gold capping layer thickness. Consequently, this leads to varying depth profiles of defects in the antiferromagnetic bulk. This was confirmed by numerical simulations of the ion damage. Detailed, quantitative, structural and magnetic characterizations were compared before and after the bombardment. These studies show that the creation of defects in the antiferromagnetic bulk is playing a crucial role in exchange bias

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