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**Growth and structure-property correlations in perpendicular exchange biased magnetic multilayers** XIAOSONG JI, HONGLYOU JU, KANNAN KRISHNAN, Department of Materials Science & Engineering, Univ. of Washington — Si/Pt<sub>200Å</sub>/(Co<sub>6Å</sub>/Pt<sub>20Å</sub>)<sub>×5</sub>/FeMn/Pt<sub>20Å</sub> multilayers with strong perpendicular anisotropy and large exchange bias field were deposited by ion-beam sputtering. It was found that the microstructure and magnetic properties were greatly affected by the growth parameters such as different substrates, buffer layer thickness, multilayer thicknesses, number of bilayers, substrate temperatures, and most critically, by the ion-beam energies which was studied for the first time. The structure-property correlations of the multilayers, as a function of ion beam energy and other sputtering parameters, were investigated with emphasis on the role of interdiffusion at the interfaces. By comparing the structural properties of the multilayers deposited with different ion-beam energies, especially the degree of interdiffusion measured by x-ray reflectivity, with the magnetic properties, we show that lower ion-beam energy deposition has stronger perpendicular anisotropy and exchange bias field due to the better control of interdiffusion.

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