Abstract Submitted
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Mössbauer Spectrometry study of Fe_xSi_{1-x} thin films[1] CATHERINE BORDEL, Department of Physics, University of California Berkeley, Groupe de Physique des Matériaux, Université de Rouen, France, JULIE KAREL, Department of Materials Science and Engineering, University of California Berkeley, JEAN JURASZEK, Groupe de Physique des Matériaux, Université de Rouen, France, FRANCES HELLMAN, Departments of Physics and Materials Science and Engineering, University of California Berkeley — Fe_3Si is ferromagnetic and potentially half-metallic and therefore of high interest for spintronics applications. Below 75 at.% Fe, a homogeneous metastable structure can be grown and leads to a tunable set of magnetic and electrical properties. We are studying Fe-Si thin films with an Fe concentration ranging from 55 to 80 at.% to determine the different structural phases that can form, their role on the Fe magnetic moment, and combined influence on the electronic band structure of the alloy. This work presents the ^{57}Fe Conversion Electron Mössbauer Spectrometry measurements obtained on 3 different samples: two epitaxial samples ($Fe_{78}Fe_{22}$ and $Fe_{65}Si_{35}$) grown on (100) MgO substrates, and an amorphous $Fe_{65}Si_{35}$ sample grown on amorphous SiN_x/Si substrates. Different Fe sites and Fe magnetic moments are observed. These studies enable differentiation between the role of composition and that of the long-range structural order.

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