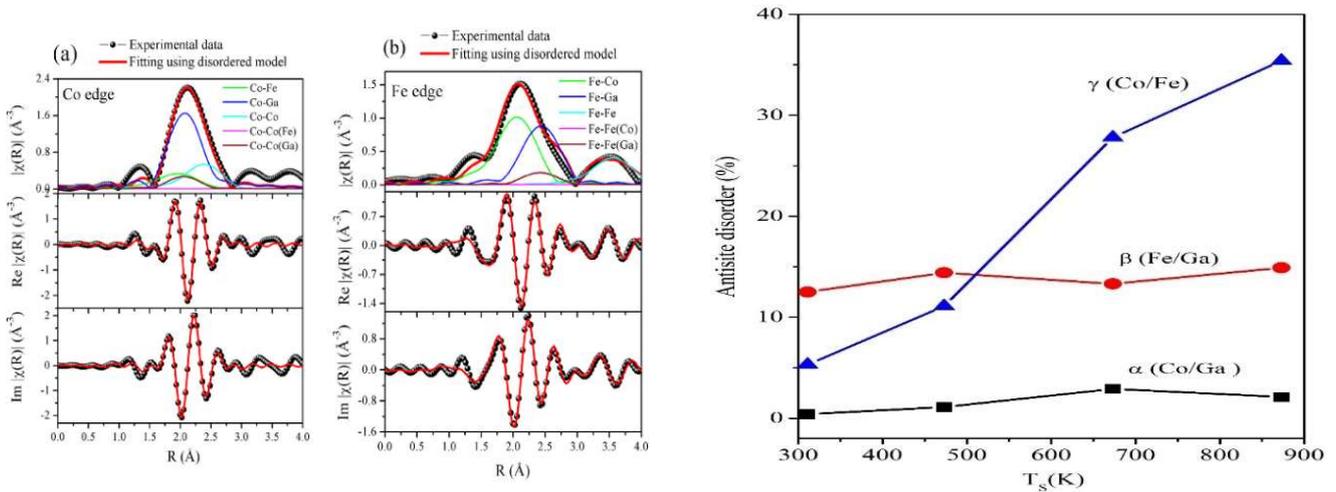
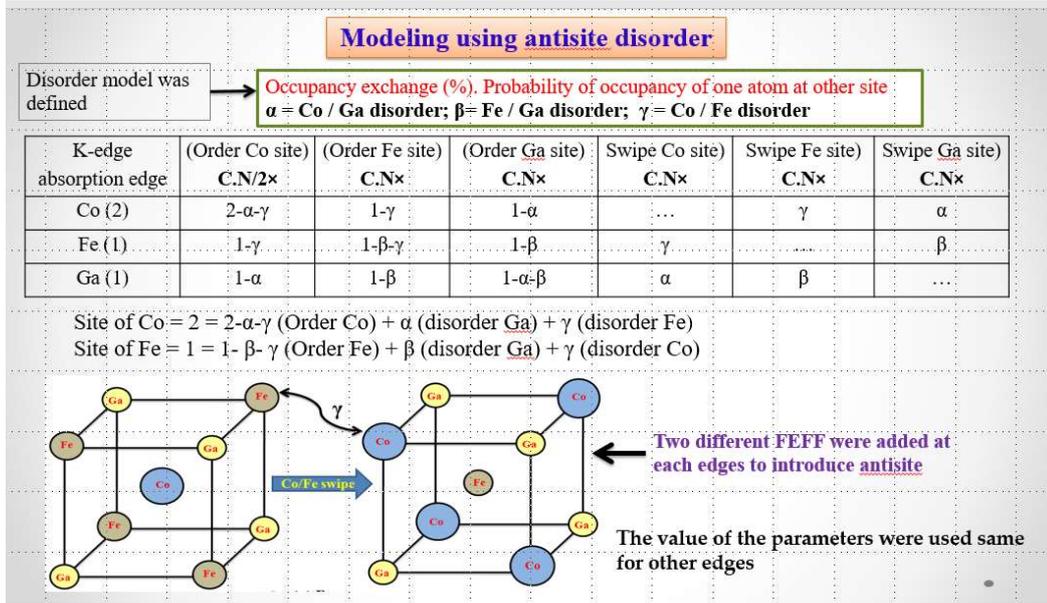


- XAS study on Heusler alloy systems (2018)



Heusler alloys are prone to have antisite disorders. As these alloys are made of 3d transition elements having similar atomic scattering factors, synchrotron radiation based EXAFS data measured at all the elemental edges separately and fitted simultaneously, give information regarding antisite disorders in the samples more precisely than X-ray diffractions measurements. We have introduced a model which can give an idea about the amount of antisite disorder present between the atomic species and applied it to Pulsed Laser Deposition (PLD) grown Heusler alloy thin films of Ni_2FeGa , Co_2FeGa , Co_2FeAl and Co_2FeSi . Here results of Co_2FeGa (CFG) thin films deposited at different substrate temperatures have been shown. In this model (top panel) the disorder parameters are indicated as α , β and γ , where the parameter α gives the probability of occurrence of the Fe (Ga) atoms at the Ga(Fe) site, β gives the probability of occurrence of the Co(Ga) atoms at the Ga(Co) site and the γ gives the probability of occurrence of Co(Fe) atom at Fe(Co) site. This model has been used to simultaneously fit the EXAFS data measured both at Co and Fe K-edges (bottom panel left) and the Co/Fe disorder factor has been quantitatively determined (bottom panel right) which shows that the Co-Fe disorder increases in the system with increase in substrate temperature.