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**Controlling Interlayer exchange coupling in ultra narrow Fe/Pt multilayered nanowire: an ab initio study** PUSPAMITRA PANIGRAHI, RANJIT PATI, Michigan Technological University, Houghton, MI 49931 — Interest in the study of magnetic/non-magnetic multilayered structures took a giant leap since Grünberg and his group established that the value of interlayer exchange coupling (IEC) depends upon the non-magnetic spacer width. The recent increase in demand for device miniaturization compelled researchers to look for novel nanoscale multilayered structures. Towards this effort, we have studied IEC in one dimensional Fe/Pt multilayered nanowires using first principles density functional approach. Our result shows the exchange coupling energy ( $J$ ) to switch sign as the width of the non-magnetic Pt spacer varies. The competition among short and long range direct exchange and the super exchange is recognized to play an important role for the non-monotonous sign in IEC depending upon the width of the Platinum spacer layer.

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