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Tuning Magnetic Proximity Effect in Pt|$CoFe_2O_4$ Bilayers by Controlling Interface Structure ADAM GOAD, University of Maryland, Baltimore County, IGOR PINCHUK, WALID AMAMOU, ROLAND KAWAKAMI, The Ohio State University — With our project, we are looking to report evidence of tuned magnetism in a thin film of Pt covering a ferromagnetic insulator, $CoFe_2O_4$. Hall bars are created to enable us to make Hall measurements of the induced magnetic Pt thin film. If anomalous hall effect is present in the Pt thin film, evident of magnetic proximity effect, then we see a non-linear relationship between the measured Hall voltage and the applied magnetic field. We have confirmed the presence of magnetic proximity effect in the Pt thin film and have engaged in tuning the effect. By using an alternating shutter method of molecular beam epitaxial growth, we can determine the termination layer of the interface. Alternating shutter method has allowed for the first demonstration of interface structure influence on magnetic proximity effect. If we can verify interface structure influence on magnetic proximity effect in thin films, then we can pursue verification of interface structure influence in two-dimensional (2D) materials. The possibilities of 2D materials are bountiful, but if we are able to exhibit magnetic proximity effect and interface structure influence in them, we can unlock the possibilities of 2D materials.

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