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FORC Analysis of the thermal hysteresis at the Metal Insulator Transition in VO_2 JUAN RAMIREZ, Universidad del Valle, Cali-Colombia, AMOS SHARONI, JONATHAN DUBI, University of California, San Diego, MARIA E. GOMEZ, Universidad del Valle, Cali-Colombia, IVAN K. SCHULLER, University of California, San Diego — We use the first order reversal curve method (FORC) in order to obtain a quantitative analysis of the temperature-driven metal-insulator transition hysteresis in VO_2 thin films. By studying the hysteresis properties of resistance vs. temperature we were able to obtain information regarding inter-domain interactions. An unexpected tail like feature in the contour plot of the FORC distribution indicates the existence of irreversible regions outside of the hysteresis loop. This irreversibility may arise from metallic domains present at temperatures below the closing of the hysteresis, which interact with the surrounding medium and change the reversal path relative to one coming from a *fully* insulating state. We develop a model where the driving force which opens hysteresis in VO_2 are inter-domain interactions. This model is intrinsically different from the Preisach model that is usually used to describe hysteresis, since it identifies a microscopic origin of the hysteresis, and provides physical parameters to characterize it. Work Supported by the US Department of Energy, AFOSR and the Colombian agencies COLCIENCIAS and the Excellence Center for Novel Materials, CENM.

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