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Overhauser effect in spin blockaded double quantum dots-the case of dual hysteresis SIDDHARTH BUDDHIRAJU, BHASKARAN MURALIDHARAN, Electrical Engineering Department, Indian Institute of Technology Bombay, Mumbai, India — In the spin blockade transport regime across GaAs double quantum dots (DQD), experiments [1] revealed that the hyperfine interaction with host nuclei can have profound consequences on the electron-spin dynamics. One of which, is the observation of bistability and flat-topped behavior in the current versus applied DC magnetic-field $I(B_{dc})$ characteristics. In this talk, we will first explain the essence of this flat-topped hysteretic behavior using a simple six-state model that captures the multiple-feedback mechanisms that are involved. We will then consider a more detailed model that elucidates the role of the physical parameter space of the DQD set up and a feedback mechanism involving the difference Overhauser field caused by the two separate nuclear spin baths of the DQD set up. [1] K. Ono and S. Tarucha, Phys Rev Lett., 92, 256803 (2004).

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