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Spin-orbit induced spin-spin coupling between electrons in coupled quantum dots JIANMIN SUN, SUHAS GANGADHARAI AH, OLEG STARYKH, University of Utah — We investigate spin-spin interaction between electrons localized in spatially separated quantum dots. We show that in the presence of single electron spin-orbit interaction (of Rashba type) in the dots and Coulomb interactions between electrons, a new anisotropic coupling of the van der Waals type between spins emerges. Unlike the standard exchange this coupling does not require overlap of the wavefunctions, and as a result becomes dominant for large distance between the dots. This ferromagnetic interaction is important in the Wigner crystal state where the exchange processes are severely suppressed.

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