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**Integration of nanomagnet for spin rotations in quantum dots** JULIEN CAMIRAND LEMYRE, DANY LACHANCE-QUIRION, MICHEL PIORO-LADRIÈRE, Université de Sherbrooke — Integrating micrometric size ferromagnets to quantum dots have proven a powerful tool to rotate single spins. In previous approaches, the distance between the magnet and the quantum dots were limiting the magnetic field gradients, thus impeding spin rotation speeds in both GaAs [1] and Si [2] quantum dots. In this work, we first reduce the size of the magnet to improve the field gradients in the dots. Furthermore, we avoid the thick insulating layer between the magnet and the gates by patterning oxidized aluminum gates with a 2 nm thick native oxide. This allows us to bring the nanomagnet closer to the quantum dots, hence increasing the magnetic field gradients by a factor of ten compared to previous structures.

[1] M. Pioro-Ladrière *et al.*, Nat. Phys., 4(10):776-779, 10 2008.

[2] E. Kawakami *et al.* Nat Nano, 9(9):666-670, 09 2014.

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