Title: Design of a new two-dimensional diluted magnetic semiconductor: Mn-doped GaN monolayer

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***Highlights (for review)**

1. It is found nonmagnetic GaN ML exhibits half-metallic FM behavior by Mn doping due to double exchange mechanism.

2.Interestingly, the FM coupling is enhanced with the increasing tensile strain due to stronger interaction between Mn-3d and N-2p state.

3.While, the FM interaction is weakened with the increasing compressive strain until it transforms into AFM under strain of -9.5 %.

4.These results provide a feasible approach for the fabrication of 2D DMS based GaN ML .