

## The Role of Electron-electron Interaction on Anti-Ferromagnetism in Graphene-on-Substrate: A Tight Binding Approach

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**Abstract.** We report here a tight-binding theoretical study of anti-ferromagnetism in graphene taking electron hopping up to third nearest neighbors. The graphene-on-substrate introduces in equivalence in the two sub-lattices of the honey-comb unit cell. The Hubbard type of repulsive Coulomb interaction within mean-field approximation introduces anti-ferromagnetic(AFM) order in both the lattices. The AFM sub-lattice magnetizations are calculated using Zubarev's Green's function technique and computed self-consistently for different ranges of electron-electron interaction.

**Keywords.** Graphene , anti-ferromagnetism , Coulomb Potential , substrate effect.

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