Quantum Monte Carlo study of magnetic correlations between adatom impurities in graphene[1] A.D. GÜÇLÜ, NEJAT BULUT, Izmir Institute of Technology, CONDENSED MATTER THEORY TEAM — We study the interaction between two adatom impurity spins in graphene within the framework of the Anderson model. In particular, we calculate the inter-impurity magnetic correlations by using the quantum Monte Carlo (QMC) technique [1]. We find that, at high temperatures, the QMC results for the magnetic correlations between the impurities are in agreement with the Ruderman-Kittel-Kasuya-Yoshida (RKKY) predictions for graphene [1]. However, as the temperature is lowered, the inter-impurity magnetic correlations become strongly enhanced over the RKKY results, which points to the significance of the electronic correlations.

[1] R.M. Fye and J.E. Hirsch, PRB v38, 433 (1988).
[2] S. Saremi, PRB v76, 184430 (2007).

Alev Devrim Güçlü
Izmir Institute of Technology

Date submitted: 15 Nov 2013   Electronic form version 1.4