Hyperfine interaction in graphene nanostructures

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Graphene is an exceptional material with attractive properties to explore fundamental physics and to use in technological applications. Recent advances in on-surface chemistry pave the way to grow with atomic precision customized graphene nanostructures that can be designed to exhibit desired magnetic and transport properties. We study systems exhibiting π magnetism and their possibility to host spin qubits. In this talk, we'll consider the hyperfine interaction (HFI) of localized spins in graphene nanostructures. We show that a simple fitting procedure allows to predict HFI from π-spin densities. Its relevance for electron and nuclear spin qubits is discussed.

References

[1] S. Sengupta T. Frederiksen, and G. Giedke, arXiv:2303.11422.

Figures

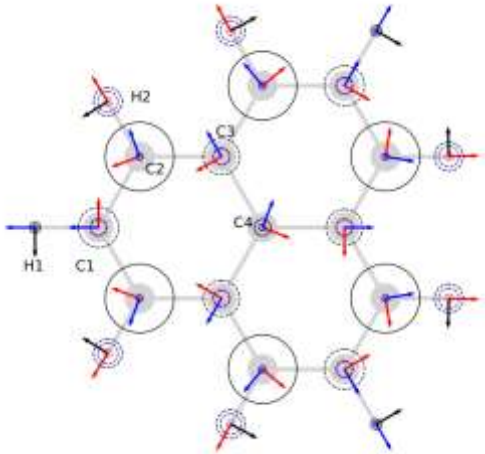

Figure 1: Depiction of the hyperfine tensors for all nuclei of [2]triangulene ($C_{13}H_9$) computed with ORCA. Radii of the circles correspond to the size of the eigenvalues of the hyperfine tensor, the arrows show the direction of the in-plane eigenvectors.