

Abstract Submitted  
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**The Hubbard dimer: exact dynamic exchange-correlation kernel, single and double excitations of a strongly correlated problem** JAIME FERRER, DIEGO CARRASCAL, Departamento de Física, Universidad de Oviedo, Spain, NEENA MAITRA, Department of Physics, Hunter College, City University of New York, New York, NY 1006, USA, KIERON BURKE, Department of Chemistry and of Physics, University of California, Irvine, CA 92697, USA — The Hubbard dimer is an exactly solvable model of a strongly correlated problem [1]. We develop here its exact frequency-dependent exchange-correlation kernel. Armed with this, we analyse the behaviour of the single and double excitations of the model as they evolve from the weak correlation regime deep into the strongly-correlated Mott-Hubbard regime. [1] D. J. Carrascal, J. Ferrer, J. C. Smith and K. Burke, The Hubbard dimer: a density functional case study of a many-body problem, *Journal of Physics: Condensed Matter* 27, 393001 (2015).

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