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Research Assistant Professor, Department of Engineering Physics, AFIT Appointment Date: 2019 (AFIT/ENP); MS, Quantum Chemistry, St. Petersburg State University, 1992; PhD, Theoretical Physics, St. Petersburg State University, 1996; PhD, Quantum Chemistry, Iowa State University, 2002. Dr. Pak's research interests include the theory of quantization, topological quantum computing and quantum theory of multi-component systems. Of particular interest is the development of new methods to accurately describe matter-antimatter interactions, and specifically positron annihilation in complex multi-electron environment. New research interests include modelling of Majorana states for topological quantum computation and development of theoretical methods to accurately predict temperature dependent short lifetime beta decay and electron capture decay at temperatures attained during nuclear explosions.

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Five Publications Most Closely Related

- 1) K.R.Brorsen, M.V.Pak, S.Hammes-Schiffer "Calculation of positron binding energies and electron-positron annihilation rates for atomic systems with the reduced explicitly correlated Hartree-Fock method in the Nuclear-Electronic Orbital framework", J. Phys. Chem. A, 121 (2), pp 515-522, 2017
- 2) A.Sirjoosingh, M.V.Pak, C.Swalina, S.Hammes-Schiffer "Reduced explicitly correlated Hartree-Fock approach within the nuclear-electronic orbital framework: Applications to positronic molecular systems", J.Chem.Phys., 139, 034103, 2013
- 3) C.Swalina, M.V.Pak, S.Hammes-Schiffer "Analysis of electron-positron wavefunctions in the nuclear-electronic orbital framework", J.Chem.Phys., 136, 164105, 2012
- 4) M.V.Pak, A.Chakraborty, S.Hammes-Schiffer "Calculation of the positron annihilation rate in PsH with the positronic extension of the explicitly correlated nuclear-electronic orbital method", J.Phys.Chem., A113, 4004, 2009
- 5) P.Adamson, X.Duan, L.Burggraf, M.V.Pak, C.Swalina, S.Hammes-Schiffer "Modeling positrons in molecular electronic structure calculations with the nuclear-electronic orbital method", J.Phys.Chem., A112, pp.1346-1351, 2008