

STABILITY THRESHOLDS OF QUANTUM SYSTEMS OF THREE CHARGED PARTICLES

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S u m m a r y

General diagram of stability thresholds (existence of bound states) for the ground and excited states, both symmetric and antisymmetric, is obtained in the mass-charge (m, Z) coordinate plane for a three-particle Coulomb system of XXY -type trions with zero total angular momentum. Variational optimization approaches with the use of Gaussian and exponential bases are proposed for high-precision three-particle calculations. A qualitative explanation of the stability diagram is given in the framework of the Born–Oppenheimer adiabatic approximation, by using simple approximating formulas for both symmetric and antisymmetric electronic energy curves.