Enhanced Binding for the semi-relativistic Nelson Model

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We consider a system of semi-relativistic $N$ particles interacting with a scalar bose field under influences of an external potential $V$. The $N$-particles do not directly interact each other but interact through the bose field. The effective potential of the particles is derived by a scaling limit of the total Hamiltonian. We assume that $V$ is sufficiently small such that the semi-relativistic Schrödinger operator $\sqrt{-\Delta + m^2} - m + V(x)$ has no negative energy ground state. Hence the total system has no ground state if there is no particle-boson interaction. We establish the ground state of the total system by using an information of the effective potential. This is joint work with Fumio Hiroshima(Kyushu university).