Emergence of bound state from a free state, is it possible? RICHARD PELPHREY, CREIGHTON LISOWSKI, RAINER GROBE, Q. CHARLES SU, Illinois State University — It is often assumed that bound states of quantum mechanical systems are intrinsically non-perturbative in nature and therefore any power series expansion methods should be inapplicable to predict the energies for attractive potentials. We propose a new truncated Borel-like summation technique that can recover the correct bound state energy from the diverging sum. It can be used to calculate bound-state energies and wave functions for quantum field theoretical models. We illustrate this approach for a Yukawa-like interaction between fermions and bosons in one spatial dimension. [1,2]. We acknowledge the support by the National Science Foundation. [1] C. Lisowski, S. Norris, R. Pelphrey, E. Stefanovich, Q. Su, R. Grobe, Ann. Phys. 373, 456 (2016). [2] Q. Z. Lv, S. Norris, R. Brennan, E. Stefanovich, Q. Su and R. Grobe, Phys. Rev. A 94, 032110 (2016).

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