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The ground state energy estimate of nonlinear Schrödinger equations

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<u>Abstract</u>

The virial theorem is a nice property for the linear Schrödinger equation in atomic and molecular physics as it gives an elegant ratio between the kinetic and potential energies and is useful in assessing the quality of numerically computed eigenvalues. If the governing equation is a nonlinear Schrödinger equation with power-law nonlinearity, then a similar ratio can be obtained but there seems no way of getting any eigenvalue estimate. It is surprising as far as we are concerned that when the nonlinearity is either square-root or saturable nonlinearity (not a power-law), one can develop a virial theorem and eigenvalue estimate of nonlinear Schrödinger (NLS) equations in R2 with square-root and saturable nonlinearity, respectively. Furthermore, we show here that the eigenvalue estimate can be used to obtain the 2nd order term (which is of order In Γ) of the lower bound of the ground state energy as the coefficient In Γ of the nonlinear term tends to infinity.

Date: October 7, 2016 (Friday)
Time: 10:30am ~ 11:30am
Venue: Room 219, Lady Shaw Building, The Chinese University of Hong Kong, Shatin

All are Welcome