BARTA'S FORMULA FOR THE PRINCIPLE EIGENVALUES OF SCHRÖDINGER OPERATORS

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Abstract: In the report, we generalize the variational formula for Dirichlet form due to Shiozawa Y. and Takeda M., and get an estimation for the first eigenvalue of general Markov processes with cadlag path, i.e. Barta's formula, by use of the variational formula. The main idea is to use unbounded test functions in variational formula instead of the bounded ones, which produces more accurate estimation. Furthermore, the eigenvalue functions of Markov processes are not necessarily bounded, so the generalized Barta's formula should be more reasonable. As an application of Barta's formula above, we obtain Barta's formula for Schrödinger operators.