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Thermal Sommerfeld effect for P-wave quarkonium in lattice NRQCD

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Annihilation of heavy particles in thermal environment (e.g., quarkonium decay in Quark-Gluon Plasma and heavy dark matter particle annihilation in early universe) is influenced by long distance non-perturbative effect because multiple exchanges of light particle between slow-moving incoming heavy particle is possible. Previously, we found that the existence of bound states in thermal QCD can lead to large enhancement for S-wave pair annihilation of heavy quark and heavy anti-quark in QGP by lattice NRQCD measurement. We continue our study of thermally averaged Sommerfeld factor, and here we report on our recent lattice calculation of the Sommerfeld factor for P-wave channel.

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