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Continuum-Discretized Coupled Channel description of (d,p) reactions with nonlocal optical potentials

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Treating deuteron breakup in (d,p) reaction requires solving three-body Schrodinger equation with nucleon optical potentials. According to a general theory of optical potentials they should be nonlocal. We present two approximate methods to account for this nonlocality within the Continuum-Discretized Coupled Channel (CDCC) method:
(1) we derive a leading-order local-equivalent CDCC model
(2) we solve the CDCC equations with velocity-dependent optical potentials that represent nonlocal optical potential in the next-to-leading order.
Examples of numerical calculations will be given.

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