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Abstract for an Invited Paper  
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### Ultracold physics with 3, 4, or 5 atoms<sup>1</sup>

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Recent studies will be reviewed [1-3], which utilize hyperspherical coordinates to treat few-body systems, concentrating on processes such as recombination, in which the initial state has 3 or more free particles in the continuum. Of particular interest are ultracold species with large two-body scattering lengths, for which universal behavior has been seen experimentally [4] that goes beyond the ordinary universality associated with the Efimov effect. The so-called three-body parameter, now understood to be universal for systems having van der Waals interactions, is readily interpreted using this theoretical framework, and predictions are made concerning A+A+B collisions as well as the homonuclear case A+A+A. Various aspects of the work presented have been carried out in collaboration with Jia Wang, Yujun Wang, Jose D'Incao, Javier von Stecher, and Brett Esry.

[1] J. Wang et al., Phys. Rev. Lett. **108**, 263001 (2012)

[2] J. Wang et al., Phys. Rev. A **84**, 052721 (2011)

[3] Y. Wang et al. arXiv:1207.6439 (2012).

[4] M. Berninger et al., Phys. Rev. Lett. **107**, 120401 (2011).

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