

## Jeremy M. Hutson: Publication List, September 2017

### Review Articles and Perspectives

224. J. M. Hutson,  
"Ultracold Chemistry",  
Science 327, 788-789 (2010).
223. J. M. Hutson and P. Soldán,  
"Molecular collisions in ultracold atomic gases",  
Int. Rev. Phys. Chem. 26, 1-28 (2007). (56 citations)
222. J. M. Hutson and P. Soldán,  
"Molecule formation in ultracold atomic gases",  
Int. Rev. Phys. Chem. 25, 497-526 (2006). (89 citations)
221. J. M. Hutson,  
"Van der Waals molecules",  
Chapter C1.4, pp. 2157-2173 in *The Encyclopedia of Chemical Physics and Physical Chemistry*,  
ed. J. H. Moore and N. D. Spencer, Institute of Physics, Bristol (2001).
220. J. M. Hutson,  
"Coupled channel methods for solving the bound-state Schrödinger equation",  
Computer Physics Communications 84, 1-18 (1994). (101 citations)
219. J. M. Hutson,  
"An introduction to the dynamics of Van der Waals complexes",  
Advances in Molecular Vibrations and Collision Dynamics 1A, 1-46 (1991). (139 citations)
218. J. M. Hutson,  
"Dynamics of Van der Waals complexes: beyond atom-diatom systems",  
pp. 67-80 in *Dynamics of Polyatomic Van der Waals Complexes*, ed. N. Halberstadt and K. C.  
Janda, Plenum, New York (1990).
217. J. M. Hutson,  
"Intermolecular forces from the spectroscopy of Van der Waals complexes",  
Annual Review of Physical Chemistry 41, 123-154 (1990). (261 citations)
216. A. D. Buckingham, P. W. Fowler and J. M. Hutson,  
"Theoretical studies of Van der Waals molecules and intermolecular forces",  
Chemical Reviews 88, 963-988 (1988). (537 citations)

### Research Papers

215. D. J. Owens and J. M. Hutson,  
"Inelastic losses in radiofrequency-dressed traps for ultracold atoms",  
submitted to PRA August 2017; available at arXiv:1708.06709, (11 pages).
214. J. Aldegunde and J. M. Hutson,  
"Hyperfine structure of alkali-metal diatomic molecules",  
submitted to PRA August 2017; available at arXiv:1708.05734, (4 pages).
213. M. D. Frye and J. M. Hutson,  
"Characterizing Feshbach resonances in ultracold scattering calculations",  
accepted for PRA September 2017; available at arXiv:1708.04661, (8 pages).
212. A. Bennett, K. Gibble, S. Kokkelmans and J. M. Hutson,  
"Atomic clock measurements of quantum scattering phase shifts spanning Feshbach resonances at ultralow fields",  
Phys. Rev. Lett. 119, 113401/1-5 (2017).
211. P. D. Gregory, J. A. Blackmore, J. Aldegunde, J. M. Hutson, and S. L. Cornish,  
"The ac Stark effect in ultracold polar  $^{87}\text{Rb}^{133}\text{Cs}$  molecules",  
Phys. Rev. A 96, 021402(R) (2017). [Rapid Communication]
210. A. Guttridge, S. A. Hopkins, S. L. Kemp, M. D. Frye, J. M. Hutson, and S. L. Cornish,  
"Interspecies thermalization in an ultracold mixture of Cs and Yb in an optical trap",  
Phys. Rev. A 96, 012704/1-10 (2017).

209. M. Gröbner, P. Weinmann, E. Kirilov, H.-C. Nägerl, P. S. Julienne, C. R. Le Sueur and J. M. Hutson,  
“Observation of interspecies Feshbach resonances in an ultracold  $^{39}\text{K}$ - $^{133}\text{Cs}$  mixture and refinement of interaction potentials”,  
Phys. Rev. A 95, 022715/1-10 (2017).
208. P. D. Gregory, J. Aldegunde, J. M. Hutson, and S. L. Cornish,  
“Controlling the rotational and hyperfine state of ultracold  $^{87}\text{Rb}^{133}\text{Cs}$  Molecules”,  
Phys. Rev. A 94, 041403(R)/1-5 (2016). [Rapid Communication]
207. J. J. Lutz and J. M. Hutson,  
“Deviations from Born-Oppenheimer mass scaling in spectroscopy and ultracold molecular physics”,  
J. Mol. Spectrosc. 330, 43-56 (2016). (Special Issue in honor of Robert Le Roy)
206. P. K. Molony, P. D. Gregory, A. Kumar, C. R. Le Sueur, J. M. Hutson and S. L. Cornish,  
“Production of ultracold  $^{87}\text{Rb}^{133}\text{Cs}$  in the absolute ground state: complete characterisation of the STIRAP transfer”,  
ChemPhysChem 17, 3811-3817 (2016). (Special Issue on Cold Molecules)
205. D. J. Owens, T. Xie and J. M. Hutson,  
“Creating Feshbach resonances for ultracold molecule formation with radiofrequency fields”,  
Phys. Rev. A 94, 023619/1-5 (2016).
204. P. K. Molony, A. Kumar, P. D. Gregory, R. Kliese, T. Puppe, C. R. Le Sueur, J. Aldegunde, J. M. Hutson and S. L. Cornish,  
“Measurement of the binding energy of ultracold  $^{87}\text{Rb}^{133}\text{Cs}$  molecules using an offset-free optical frequency comb”,  
Phys. Rev. A 94, 022507/1-8 (2016).
203. M. D. Frye, M. Morita, C. L. Vaillant, D. G. Green and J. M. Hutson,  
“The approach to chaos in ultracold atomic and molecular physics: statistics of near-threshold bound states for  $\text{Li}+\text{CaH}$  and  $\text{Li}+\text{CaF}$ ”,  
Phys. Rev. A 93, 052713/1-11 (2016).
202. D. G. Green, C. L. Vaillant, M. D. Frye, M. Morita and J. M. Hutson,  
“Quantum chaos in ultracold collisions between  $\text{Yb}(^1\text{S}_0)$  and  $\text{Yb}(^3\text{P}_2)$ ”,  
Phys. Rev. A 93, 022703/1-5 (2016).
201. J. Lim, M. D. Frye, J. M. Hutson and M. R. Tarbutt,  
“Modeling sympathetic cooling of molecules by ultracold atoms”,  
Phys. Rev. A 92, 053419/1-15 (2015).
200. M. D. Frye, P. S. Julienne and J. M. Hutson,  
“Cold atomic and molecular collisions: approaching the universal loss regime”,  
New J. Phys. 17, 045019/1-13 (2015).
199. P. K. Molony, P. D. Gregory, Z. Ji, B. Lu, M. P. Köppinger, C. R. Le Sueur, C. L. Blackley, J. M. Hutson and S. L. Cornish,  
“Creation of ultracold  $^{87}\text{Rb}^{133}\text{Cs}$  molecules in the rovibrational ground state”,  
Phys. Rev. Lett. 113, 255301/1-5 (2014). (54 citations)
198. T. Takekoshi, L. Reichsöllner, A. Schindewolf, J. M. Hutson, C. R. Le Sueur, O. Dulieu, F. Ferlaino, R. Grimm and H.-C. Nägerl,  
“Ultracold dense samples of dipolar RbCs molecules in the rovibrational and hyperfine ground state”,  
Phys. Rev. Lett. 113, 205301/1-5 (2014).  
Paper selected as an *Editors’ Suggestion* (82 citations)
197. B. Huang, K. M. O’Hara, R. Grimm, J. M. Hutson and D. S. Petrov,  
“The three-body parameter for Efimov states in lithium-6”,  
Phys. Rev. A 90, 043636/1-9 (2014).  
Paper selected as an *Editors’ Suggestion*
196. H. J. Patel, C. L. Blackley, S. L. Cornish and J. M. Hutson,  
“Feshbach resonances, molecular bound states and prospects of ultracold molecule formation in

- mixtures of ultracold K and Cs",  
Phys. Rev. A 90, 032716/1-10 (2014).
195. P. S. Julienne and J. M. Hutson,  
"Contrasting the wide Feshbach resonances in  ${}^6\text{Li}$  and  ${}^7\text{Li}$ ",  
Phys. Rev. A 89, 052715/1-9 (2014).
194. B. Huang, L. A. Sidorenkov, R. Grimm and J. M. Hutson,  
"Observation of the second triatomic resonance in Efimov's scenario",  
Phys. Rev. Lett. 112, 190401/1-6 (2014).  
Paper selected for a *Viewpoint in Physics* at <http://physics.aps.org/articles/v7/51> (41 citations)
193. M. D. Frye and J. M. Hutson,  
"Collision cross sections for the thermalization of cold gases",  
Phys. Rev. A 89, 052705/1-5 (2014).
192. C. L. Blackley, P. S. Julienne and J. M. Hutson,  
"Effective-range approximations for resonant scattering of cold atoms",  
Phys. Rev. A 89, 042701/1-10 (2014).  
Paper selected as an *Editors' Suggestion*
191. M. P. Köppinger, D. J. McCarron, D. L. Jenkin, P. K. Molony, H.-W. Cho, S. L. Cornish,  
C. R. Le Sueur, C. L. Blackley and J. M. Hutson,  
"Production of optically trapped  ${}^{87}\text{RbCs}$  Feshbach molecules",  
Phys. Rev. A 89, 033604/1-8 (2014).
190. J. J. Lutz and J. M. Hutson,  
"Reactions between cold methyl halide molecules and alkali-metal atoms",  
J. Chem. Phys. 140, 014303/1-9 (2014).
189. M. L. González-Martínez and J. M. Hutson,  
"Sympathetic cooling of fluorine atoms with ultracold atomic hydrogen",  
Phys. Rev. A 88, 053420/1-10 (2013).
188. M. L. González-Martínez and J. M. Hutson,  
"Ultracold hydrogen atoms: a versatile coolant to produce ultracold molecules",  
Phys. Rev. Lett. 111, 203004/1-6 (2013).
187. M. L. González-Martínez and J. M. Hutson,  
"Magnetically tunable Feshbach resonances in  $\text{Li} + \text{Yb}({}^3P_J)$ ",  
Phys. Rev. A 88, 020701(R)/1-5 (2013). [Rapid Communication]
186. D. A. Brue and J. M. Hutson,  
"Prospects of forming molecules in  ${}^2\Sigma$  states by magnetoassociation of alkali-metal atoms  
with Yb",  
Phys. Rev. A 87, 052709/1-12 (2013). (24 citations)
185. G. Zürn, T. Lompe, A. N. Wenz, S. Jochim, P. S. Julienne and J. M. Hutson,  
"Precise characterization of  ${}^6\text{Li}$  Feshbach resonances using trap-sideband-resolved RF spectroscopy  
of weakly bound molecules",  
Phys. Rev. Lett. 110, 135301/1-5 (2013). (64 citations)
184. M. Berninger, A. Zenesini, B. Huang, W. Harm, H.-C. Nägerl, F. Ferlaino, R. Grimm,  
P. S. Julienne and J. M. Hutson,  
"Feshbach resonances, weakly bound molecular states and coupled-channel potentials for cesium  
at high magnetic field",  
Phys. Rev. A 87, 032517/1-17 (2013). (31 citations)
183. J. F. E. Croft and J. M. Hutson,  
"Multichannel Quantum Defect Theory for cold molecular collisions with a strongly anisotropic  
potential energy surface",  
Phys. Rev. A 87, 032710/1-7 (2013).
182. C. L. Blackley, C. R. Le Sueur, J. M. Hutson, D. J. McCarron, M. P. Köppinger, H.-W. Cho,  
D. L. Jenkin and S. L. Cornish,  
"Feshbach resonances in ultracold  ${}^{85}\text{Rb}$ ",  
Phys. Rev. A 87, 033611/1-7 (2013).

181. H.-W. Cho, D. J. McCarron, M. P. Köppinger, D. L. Jenkin, K. L. Butler, P. S. Julienne, C. L. Blackley, C. R. Le Sueur, J. M. Hutson and S. L. Cornish, "Feshbach spectroscopy of an ultracold mixture of  $^{85}\text{Rb}$  and  $^{133}\text{Cs}$ ", Phys. Rev. A 87, 010703(R)/1-5 (2013). [Rapid Communication]
180. J. F. E. Croft, J. M. Hutson and P. S. Julienne, "Optimized Multichannel Quantum Defect Theory for cold molecular collisions", Phys. Rev. A 86, 022711/1-7 (2012).
179. T. Takekoshi, M. Debatin, R. Rameshan, F. Ferlaino, R. Grimm, H.-C. Nägerl, C. R. Le Sueur, J. M. Hutson, P. S. Julienne, S. Kotochigova and E. Tiemann, "Towards the production of ultracold ground-state RbCs molecules: Feshbach resonances, weakly bound states, and the coupled-channel model", Phys. Rev. A 85, 032506/1-14 (2012). (69 citations)
178. D. A. Brue and J. M. Hutson, "Magnetically tunable Feshbach resonances in ultracold Li-Yb mixtures", Phys. Rev. Lett. 108, 043201/1-5 (2012). (35 citations)
177. A. O. G. Wallis and J. M. Hutson, "Optically induced conical intersections in traps for ultracold atoms and molecules", Phys. Rev. A 84, 051402(R)/1-4 (2011). [Rapid Communication]
176. M. L. González-Martínez and J. M. Hutson, "Effect of hyperfine interactions on ultracold molecular collisions:  $\text{NH}(^3\Sigma^-)$  with  $\text{Mg}(^1\text{S})$  in magnetic fields", Phys. Rev. A 84, 052706/1-11 (2011).
175. J. F. E. Croft, A. O. G. Wallis, J. M. Hutson and P. S. Julienne, "Multichannel Quantum Defect Theory for cold molecular collisions", Phys. Rev. A 84, 042703/1-9 (2011).
174. M. Berninger, A. Zenesini, B. Huang, W. Harm, H.-C. Nägerl, F. Ferlaino, R. Grimm, P. S. Julienne and J. M. Hutson, "Universality of the three-body parameter for Efimov states in ultracold cesium", Phys. Rev. Lett. 107, 120401/1-5 (2011). (94 citations)
173. W. Skomorowski, R. Moszyński, M. L. González-Martínez and J. M. Hutson, "Cold collisions of an open-shell S-state atom with a  $^2\Pi$  molecule:  $\text{N}(^4\text{S})$  colliding with  $\text{OH}$  in a magnetic field", Phys. Chem. Chem. Phys. 13, 19077-19088 (2011).
172. L. P. Parazzoli, N. J. Fitch, P. S. Żuchowski, J. M. Hutson and H. J. Lewandowski, "Large effects of electric fields on atom-molecule collisions at millikelvin temperatures", Phys. Rev. Lett. 106, 193201/1-4 (2011).
171. S. Tokunaga, W. Skomorowski, P. S. Żuchowski, R. Moszynski, J. M. Hutson, E. A. Hinds and M. R. Tarbutt, "Prospects for sympathetic cooling of molecules in electrostatic, ac and microwave traps", Eur. Phys. J. D 65, 141-149 (2011).
170. A. O. G. Wallis, E. J. J. Longdon, P. S. Żuchowski and J. M. Hutson, "The prospects of sympathetic cooling of  $\text{NH}$  molecules with  $\text{Li}$  atoms", Eur. Phys. J. D, 65, 151-160 (2011).
169. L. M. C. Janssen, P. S. Żuchowski, A. van der Avoird, G. C. Groenenboom and J. M. Hutson, "Cold and ultracold  $\text{NH-NH}$  collisions in magnetic fields", Phys. Rev. A 83, 022713/1-8 (2011).
168. L. M. C. Janssen, P. S. Żuchowski, A. van der Avoird, J. M. Hutson and G. C. Groenenboom, "Cold and ultracold  $\text{NH-NH}$  collisions: the field-free case", J. Chem. Phys. 134, 124309/1-9 (2011).
167. W. Skomorowski, F. Pawłowski, T. Korona, R. Moszyński, P. S. Żuchowski and J. M. Hutson, "Interaction between  $\text{LiH}$  molecule and  $\text{Li}$  atom from state-of-the-art electronic structure

- calculations”,  
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166. P. S. Żuchowski and J. M. Hutson,  
“Cold collisions of N atoms and NH molecules in magnetic fields”,  
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165. P. S. Żuchowski, J. Aldegunde and J. M. Hutson,  
“Ultracold RbSr molecules can be formed by magnetoassociation”,  
Phys. Rev. Lett. 105, 153201/1-4 (2010). (57 citations)
164. P. S. Żuchowski and J. M. Hutson,  
“Reactions of ultracold alkali metal dimers”,  
Phys. Rev. A 81, 060703(R)/1-4 (2010). [Rapid Communication] (108 citations)
163. J. G. Danzl, M. J. Mark, E. Haller, M. Gustavsson, R. Hart, J. Aldegunde, J. M. Hutson and  
H.-C. Nägerl,  
“An ultracold, high-density sample of rovibronic ground-state molecules in an optical lattice”,  
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162. H. Ran, J. Aldegunde and J. M. Hutson,  
“Hyperfine structure in the microwave spectra of ultracold polar molecules”,  
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161. A. O. G. Wallis and J. M. Hutson,  
“Production of ultracold NH molecules by sympathetic cooling with Mg”,  
Phys. Rev. Lett. 103, 183201/1-4 (2009). (49 citations)
160. J. M. Hutson, M. Beyene and M. L. González-Martínez,  
“Dramatic reductions in inelastic cross sections for ultracold collisions near Feshbach resonances”,  
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159. J. Aldegunde, H. Ran and J. M. Hutson,  
“Manipulating ultracold polar molecules with microwave radiation:  
the influence of hyperfine structure”,  
Phys. Rev. A 80, 043410/1-5 (2009).
158. A. O. G. Wallis, S. A. Gardiner and J. M. Hutson,  
“Conical intersections in laboratory coordinates with ultracold molecules”,  
Phys. Rev. Lett. 103, 083201/1-4 (2009).
157. P. S. Żuchowski and J. M. Hutson,  
“Low-energy collisions of NH<sub>3</sub> and ND<sub>3</sub> with ultracold Rb atoms”,  
Phys. Rev. A 79, 062708/1-12 (2009). (44 citations)
156. P. Soldán, P. S. Żuchowski and J. M. Hutson,  
“Prospects for sympathetic cooling of polar molecules:  
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Faraday Discussion 142, 191-201 (2009).
155. S. Ghosal, R. J. Doyle, C. P. Koch and J. M. Hutson,  
“Stimulating the production of deeply bound RbCs molecules with laser pulses:  
the role of spin-orbit coupling in forming ultracold molecules”,  
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154. J. Aldegunde and J. M. Hutson,  
“The hyperfine energy levels of alkali metal dimers:  
ground-state homonuclear molecules in magnetic fields”,  
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153. J. M. Hutson, E. Tiesinga and P. S. Julienne,  
“Avoided crossings between bound states of ultracold Cesium dimers”,  
Phys. Rev. A 78, 052703/1-10 (2008).
152. J. Aldegunde, B. A. Rivington, P. S. Żuchowski and J. M. Hutson,  
“The hyperfine energy levels of alkali metal dimers:

- ground-state polar molecules in electric and magnetic fields”,  
Phys. Rev. A 78, 033434/1-8 (2008). (58 citations)
151. P. S. Żuchowski and J. M. Hutson,  
“Prospects for producing ultracold NH<sub>3</sub> molecules by sympathetic cooling:  
a survey of interaction potentials”,  
Phys. Rev. A 78, 022701/1-9 (2008).
150. M. P. Deskevich, A. B. McCoy, J. M. Hutson and D. J. Nesbitt,  
“Large-amplitude quantum mechanics in polyatomic hydrides:  
II. A particle-on-a-sphere model for XH<sub>n</sub> (*n* = 4, 5)”,  
J. Chem. Phys. 128, 094306/1-13 (2008).
149. M. T. Cvitaš, P. Soldán, J. M. Hutson, P. Honvault and J.-M. Launay,  
“Interactions and dynamics in ultracold Li + Li<sub>2</sub> collisions”,  
J. Chem. Phys. 127, 074302/1-19 (2007). (50 citations)
148. J. M. Hutson,  
“Feshbach resonances in atomic and molecular collisions:  
threshold behaviour and suppression of poles in scattering length”,  
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147. M. L. González-Martínez and J. M. Hutson,  
“Ultracold atom-molecule collisions and bound states in magnetic fields:  
tuning zero-energy Feshbach resonances in He + NH (<sup>3</sup>Σ)”,  
Phys. Rev. A 75, 022702/1-14 (2007). (55 citations)
146. M. Lara, J. L. Bohn, D. E. Potter, P. Soldán and J. M. Hutson,  
“Cold collisions of OH and Rb. I: the field-free case”,  
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145. M. Lara, J. L. Bohn, D. E. Potter, P. Soldán and J. M. Hutson,  
“Ultracold Rb-OH collisions and prospects for sympathetic cooling”,  
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144. R. J. Doyle, D. M. Hirst and J. M. Hutson,  
“Ab initio potential energy surfaces, bound states and electronic spectrum of the Ar-SH  
complex”,  
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143. M. T. Cvitaš, P. Soldán and J. M. Hutson,  
“Long range intermolecular forces in triatomic systems:  
connecting the atom-diatom and atom-atom-atom representations”,  
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142. H. Jiang, M. Xu, J. M. Hutson and Z. Bačić,  
“Ar<sub>n</sub>-HF Van der Waals clusters revisited: energetics and HF vibrational frequency shifts from  
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to 12”,  
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141. M. T. Cvitaš, P. Soldán, J. M. Hutson, P. Honvault and J.-M. Launay,  
“Ultracold collisions involving heteronuclear alkali metal dimers”,  
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140. G. Quémener, P. Honvault, J.-M. Launay, P. Soldán, D. E. Potter and J. M. Hutson,  
“Ultracold quantum dynamics: Spin-polarized K + K<sub>2</sub> collisions with three identical bosons or  
fermions”,  
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“Ultracold Li + Li<sub>2</sub> collisions: bosonic and fermionic cases”,  
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138. I. N. Kozin, M. M. Law, J. Tennyson and J. M. Hutson,  
“Calculating the energy levels of isomerizing tetraatomic molecules.

- II. The vibrational states of acetylene and vinylidene",  
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137. I. N. Kozin, M. M. Law, J. Tennyson and J. M. Hutson,  
"New vibration-rotation code for tetraatomic molecules exhibiting wide-amplitude motion: WAVR4",  
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136. P. Soldán and J. M. Hutson,  
"Interaction of NH molecules with rubidium atoms:  
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135. M. Meuwly and J. M. Hutson,  
"Potential energy surfaces and bound states for the open-shell Van der Waals cluster Br-HF",  
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134. I. N. Kozin, M. M. Law, J. M. Hutson and J. Tennyson,  
"Calculating the energy levels of isomerizing tetraatomic molecules.  
I. The rovibrational bound states of Ar<sub>2</sub>HF",  
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133. P. Soldán, M. T. Cvitaš and J. M. Hutson,  
"Three-body non-additive forces between spin-polarized alkali metal atoms",  
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132. P. Soldán, M. T. Cvitaš, J. M. Hutson, P. Honvault and J.-M. Launay,  
"Quantum dynamics of ultracold Na + Na<sub>2</sub> collisions",  
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131. M. Xu, Z. Bačić and J. M. Hutson,  
"Clusters containing open-shell molecules: III. Quantum five-dimensional / two-surface bound-state calculations on Ar<sub>n</sub>OH Van der Waals clusters ( $X^2\Pi$ ,  $n = 4$  to 12)",  
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130. M. Xu, Z. Bačić and J. M. Hutson,  
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129. P. Soldán and J. M. Hutson,  
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128. A. Carrington, D. I. Gammie, J. C. Page, A. M. Shaw and J. M. Hutson,  
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127. J. M. M. Howson and J. M. Hutson,  
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124. N. J. Wright and J. M. Hutson,  
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