Universal Three-Body Parameter of Heavy-Heavy-Light systems with negative intraspecies scattering length HUILI HAN, CAIYUN ZHAO, TINGYUN SHI, Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences — we investigate the dependence of Three-body Parameter on the intraspecies interaction in heteronuclear atomic systems. Through calculating the $|a_-^{(1)}|$ for ten mass imbalanced systems, we predict the universal dependence of $|a_-^{(1)}|$ on the background scattering length a_{HH}. We find that the $|a_-^{(1)}|$ have a dramatically strong dependence on the background scattering length a_{HH} for the mass less-imbalanced systems, and for the strong mass imbalanced systems, the interspecies interaction plays less important role in determining the value of $|a_-^{(1)}|$. Specially, when the homonuclear atoms are in resonance, the $a_-^{(1)}$ is nearly a constant expressed in terms of the van der Waals length $r_{vdW,HL}$: $a_-^{(1)} = -(6.3 \pm 15\%)r_{vdW,HL}$.

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