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Indentification of low-mass accreted galaxies with metal-poor stars

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The Galactic halo is expected to contain signatures of past galaxy accretions. In fact, the kinematics of halo stars in the Gaia DR2 clearly shows the presence of a massive accreted galaxy. We search for signatures of other less-massive galaxies through the combination of chemical abundances and kinematics of metal-poor stars by using the data from the SAGA database, LAMOST DR4, and APOGEE. From the LAMOST DR4, we first show that the distribution of metal-poor stars in the phase space dramatically changes as a function of metallicity, indicating the occurrence of multiple accretions of galaxies with different metallicity. Abundance ratios of individual elements from the SAGA database demonstrate that the over-density of stars on extreme retrograde orbits, which is only seen at low-metallicity, is caused by an accretion of less-massive dwarf galaxy; they form a distinct low-α elements sequence in the abundance space. Finally, we present results of a trial to identify this population in APOGEE through a statistical approach that combines stellar kinematics and chemical abundances and discuss future prospects to identify relatively low-mass accreted galaxies.

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Talk/Poster

Talk

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