

From star clusters to field populations: survived, destroyed and migrated clusters



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Impacts of spiral arms on the kinematics of the young stars

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We study the kinematics of the young stars around the spiral arms in the Milky Way, using Gaia DR3. We first demonstrate that we can measure the circular velocity at the position of the Sun in the Milky Way using the young OB stars, but there is a clear sign of the impact of the Local arm. From the kinematics of these stars and also of old stars, we find that the Local arm is not a minor arm, but a significant major spiral arm. In addition, the stellar kinematics indicates that the Local arm is a transient dynamic arm, and it is likely to be a growing phase. We also discuss the kinematics of the young stars around the Perseus and Outer arms. The kinematics of the young star clusters are likely to be also affected by the spiral arms in similar way to these young stars, and they will be a great chemo-dynamical tracer to further study of the nature of the spiral arm. Finally, we also briefly discuss the potential impact of the Local arm on the nearby star clusters.

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