N10a Specific angular momentum loss from a close binary system caused by stellar wind

○ Jahanara Begum, Megumi Mitsumoto, Takuya Matsuda

Three-dimensional hydrodynamic simulations of mass transfer in an interacting binary system are studied, in which one component undergoes mass loss through stellar wind. The goal of the present work is to calculate the specific angular momentum loss from a close binary system caused by the stellar wind. The simulations are performed for three different cases of mass ratios, $q = 1/3, 1$ and 3. Three kinds of wind mechanism, namely, mechanically driven wind, thermally driven wind and radiation driven wind, are studied. The value of the specific angular momentum, l_w does not depend crucially on the wind mechanism which only modifies the relation between the wind velocity at the surface of the mass-losing star, V, to the average velocity at the critical Roche lobe surface, V_R. We show that, l_w does not reach value higher than ~ 1.3 for very low wind velocities, and, therefore, the binary system shrinks. l_w reaches the limiting case of a spherically symmetric wind for large wind velocities, for mass ratio smaller or equal to 1. For larger mass ratio, however, l_w is slightly larger than the expected limiting value. The specific angular momentum, l_w is large enough in a wide range velocities to imply a shrinking of the system. This makes the symbiotic channel for type Ia supernovae a plausible one.