



Figure 1: The elastic collision with different masses

We first construct the total momentum and obtain the world-line of the center of mass. Now the collision is the physical reflection on this world line. We draw the ideally elastic collision for four different relations of mass, but with equal initial velocities. After the collision, the possible motions of each partner forms an oblique circular cone about the world line of the center of mass. The vertex angle is inversely proportional to the inertial mass itself. The undisturbed motion yields always a generatrix of the cone.

In the lower left we recognize the situation shown in both the previous figures. The cones are cut open in order to facilitate the comparison. In the lower right the pushing mass much smaller than the pushed one, in the upper left we see the opposite case. In the upper part, the pushing mass is heavier than the pushed one, in the lower part, this relation is inverted.