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Center-of-Mass Technique applied to the Ideal Inelastic Collisions Case EDWARD DOWDYE, JR., Pure Classical Physics Research — Findings show that the law of conservation of kinetic energy directly applies to inelastic collisions as well as to elastic collisions. The kinetic energy transfer is consistent with the law of conservation of energy which states that energy can neither be created nor annihilated. In an ideal inelastic collision, two colliding masses, M_1 and M_2, will move jointly at their center-of-mass velocity, $V_{CM} = \frac{M_1 V_1 + M_2 V_2}{M_1 + M_2}$. As a consequence, the equation $\frac{1}{2} M_1 V_1^2 + \frac{1}{2} M_2 V_2^2 - \frac{1}{2} M_1 \left(V_1 - V_{CM}\right)^2 - \frac{1}{2} M_2 \left(V_2 - V_{CM}\right)^2 = \frac{1}{2}\left(M_1 + M_2\right) V_{CM}^2$ applies to the ideal inelastic collision. The quantities $\frac{1}{2} M_1 V_1^2$ and $\frac{1}{2} M_2 V_2^2$ are the initial kinetic energies of the masses M_1 and M_2, respectively, that would be available in the rest frame if the two masses were to come to a complete stop, $V_1 = 0$ and $V_2 = 0$. The negative terms, $-\frac{1}{2} M_1 \left(V_1 - V_{CM}\right)^2$ and $-\frac{1}{2} M_2 \left(V_2 - V_{CM}\right)^2$, are the kinetic energies transferred into the center-of-mass frame as M_1 and M_2 go from velocities, V_1 and V_2 , respectively, to the velocity V_{CM}. The kinetic equation leads directly to the valid conservation of momentum equation $M_1 V_1 + M_2 V_2 = \left(M_1 + M_2\right) V_{CM}$, a mathematical proof that the kinetic energy is totally conserved for the ideal inelastic collision. For details: http://www.extinctionshift.com/SignificantFindingsInelastic.htm

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