Summary: Central Impact Problems

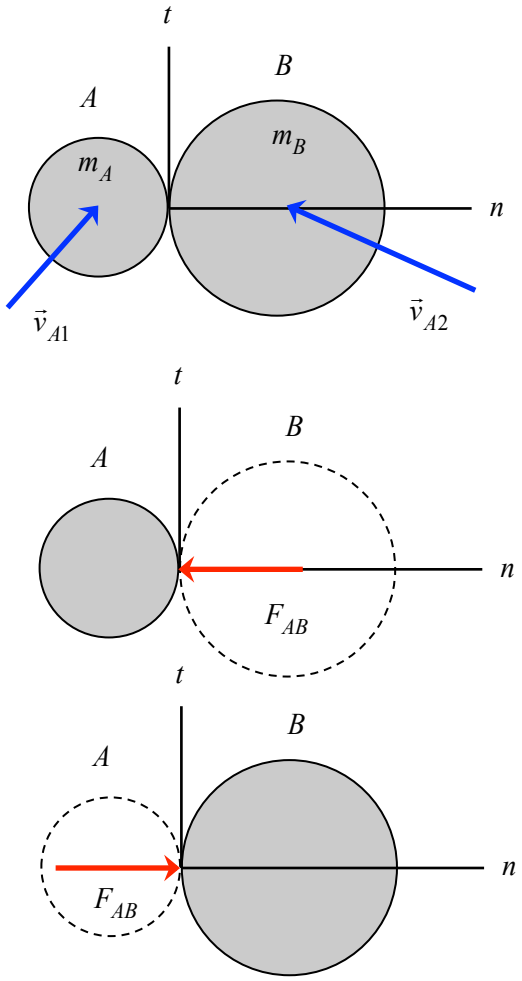
FUNDAMENTAL equations: the linear impulse-momentum equations and coefficient of restitution (COR) equation

$$A: \quad \sum F_t = 0 \;\Rightarrow\; m_A v_{A1t} = m_A v_{A2t} \;\Rightarrow\; v_{A2t} = v_{A1t}$$

$$B: \quad \sum F_t = 0 \;\Rightarrow\; m_B v_{B1t} = m_B v_{B2t} \;\Rightarrow\; v_{B2t} = v_{B1t}$$

$$A+B: \quad \sum F_n = 0 \;\Rightarrow\; m_A v_{A1n} + m_B v_{B1n} = m_A v_{A2n} + m_B v_{B2n}$$

$$COR: \quad e = -\left(\frac{v_{B2n} - v_{A2n}}{v_{B1n} - v_{A1n}} \right)$$



COMMENTS:

- The COR equation is valid for ONLY the n-components of velocity.
- Energy is NOT conserved during impact, except for e = 1.