

$$\frac{d}{dt} \left\{ \begin{pmatrix} \partial_{v_x} \\ \partial_{v_x} \\ \partial_{v_x} \end{pmatrix} K \right\} \xrightarrow{\text{red}} \begin{array}{l} m \frac{dv_x}{dt} \\ m \frac{dv_y}{dt} \\ m \frac{dv_z}{dt} \end{array} = \begin{array}{l} -\frac{\partial U}{\partial x} \\ -\frac{\partial U}{\partial y} \\ -\frac{\partial U}{\partial z} \end{array} \xleftarrow{\text{blue}} \begin{pmatrix} \partial_x \\ \partial_y \\ \partial_z \end{pmatrix} (-U)$$