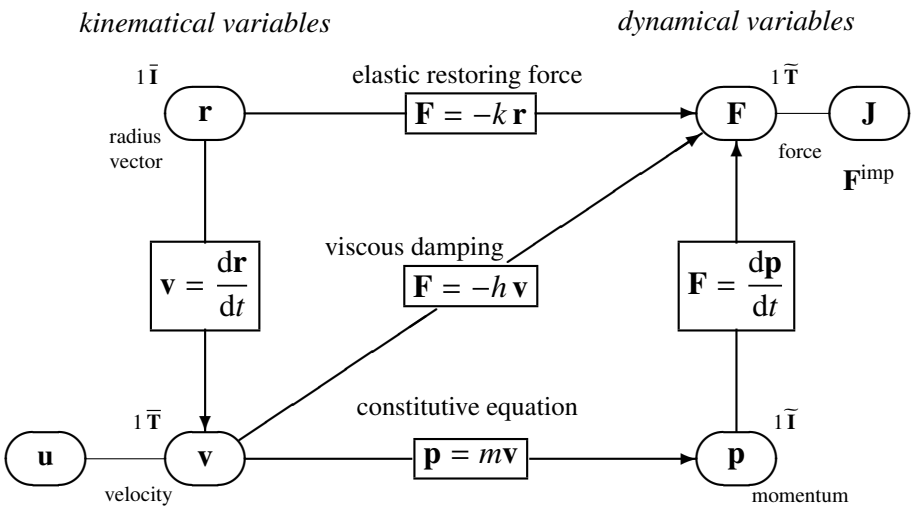
Table 1. Particle mechanics

Particle mechanics



fundamental equation $\frac{\mathrm{d}}{\mathrm{d}t}\left(m\frac{\mathrm{d}\,\mathbf{r}}{\mathrm{d}t}\right) = -k\mathbf{r} - h\frac{\mathrm{d}\mathbf{r}}{\mathrm{d}t} + \mathbf{F}^{\mathrm{imp}}$

Federica, telaio!

kinematical variables

$$\textit{velocity} \quad \mathbf{v}(t) = \frac{\mathrm{d}\mathbf{r}(t)}{\mathrm{d}t} = \lim_{\overline{T}\longrightarrow 0}\frac{\mathbf{u}[\overline{\mathbf{T}}]}{\overline{T}}$$

$$\textit{radius vector} \quad \mathbf{r}(t) = \mathbf{r}_0 + \int_0^t \mathbf{v}(t')\,\mathrm{d}t'$$

$$\textit{displacement} \quad \mathbf{u}[\overline{\mathbf{T}}] = \int_{\overline{\mathbf{T}}} \mathbf{v}(t')\,\mathrm{d}t' = \int_{t_1}^{t_2} \mathbf{v}(t')\,\mathrm{d}t' = \mathbf{r}(t_2) - \mathbf{r}(t_1)$$

dynamical variables

$$\textit{momentum} \quad \mathbf{p}(t) = \int_0^t \mathbf{F}(t')\,\mathrm{d}t'$$

$$\textit{impulse} \quad \mathbf{J}[\widetilde{\mathbf{T}}] = \int_{\widetilde{\mathbf{T}}} \mathbf{f}(t')\,\mathrm{d}t' = \int_{t_1}^{t_2} \mathbf{F}(t')\,\mathrm{d}t' = \mathbf{p}(t_2) - \mathbf{p}(t_1)$$

$$\textit{force} \quad \mathbf{F}(t) = \frac{\mathrm{d}\mathbf{p}(t)}{\mathrm{d}t} = \lim_{\widetilde{T}\longrightarrow 0}\frac{\mathbf{J}[\widetilde{\mathbf{T}}]}{\widetilde{T}}$$

PMd1-10; http://discretephysics.dica.units.it