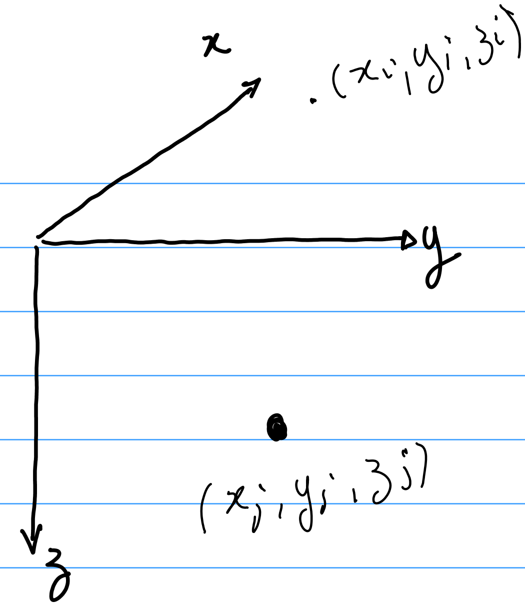
Point mass



gravitational potential

$$U_{ij} \equiv U(x_i, y_i, z_i) = G \frac{m_j}{r_{ij}}$$

$$r_{ij} = \left[(x_i - x_j)^2 + (y_i - y_j)^2 + (z_i - z_j)^2 \right]^{1/2}$$

gravitational aceleration

$$\mathbf{a}_{ij} \equiv \mathbf{a}(x_i, y_i, z_i) = \nabla U_{ij}$$

gravitational tensor

$$\boldsymbol{\Gamma}_{ij} \equiv \boldsymbol{\Gamma}(x_i, y_i, z_i) = \nabla^2 U_{ij} = \begin{bmatrix} \partial_{xx} U & \partial_{xy} U & \partial_{xz} U \\ \partial_{xy} U & \partial_{yy} U & \partial_{yz} U \\ \partial_{xz} U & \partial_{yz} U & \partial_{zz} U \end{bmatrix}$$

$$\partial_\alpha U_{ij} = -G m_j \frac{\alpha_i - \alpha_j}{r_{ij}^3}$$

$$\partial_{\alpha\beta} U_{ij} = \begin{cases} G m_j \left[\dfrac{3(\alpha_i - \alpha_j)^2}{r_{ij}^5} - \dfrac{1}{r_{ij}^3} \right], & \alpha = \beta \\ G m_j \dfrac{3(\alpha_i - \alpha_j)(\beta_i - \beta_j)}{r_{ij}^5}, & \alpha \neq \beta \end{cases}$$

gravity disturbance

$$\boxed{\delta g_i \approx -G m_j \frac{z_i - z_j}{r_{ij}^3}}$$

$$\alpha = x, y, z$$