

Assignment 1 - Presentation

Álvaro Rodríguez Luis

Communication Skills I

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INTRODUCTION



GOVERNING EQUATION

$$-(EI\mathbf{r}'')'' + [(T - EI\kappa^2)\mathbf{r}']' + [GJ\boldsymbol{\tau}(\mathbf{r}' \times \mathbf{r}'')] + \mathbf{f} = \left(\frac{1}{4}\pi d\rho_c\mathbf{l}\right) \ddot{\mathbf{r}}$$

$$\rho_0 \frac{\partial^2 \mathbf{r}(t, s)}{\partial t^2} = \frac{\partial}{\partial s} (T(t, s)\mathbf{t}(t, s)) + \mathbf{f}(t, s)(1 + e(t, s))$$

$$\mathbf{t}(t, s) = \frac{1}{1 + e} \frac{\partial \mathbf{r}}{\partial s},$$

$$T(t, s) = EA_0 \left(e + \beta \frac{\partial e}{\partial t} \right)$$

$$e = \left| \frac{\partial \mathbf{r}}{\partial s} \right| - 1.$$

SPHERICAL BODY TOWING BOUNDARY CONDITIONS

$$\mathbf{a}_{sphere} = \frac{\mathbf{F}_M + \mathbf{F}_{gb} + \mathbf{F}_T}{m + C_a}$$

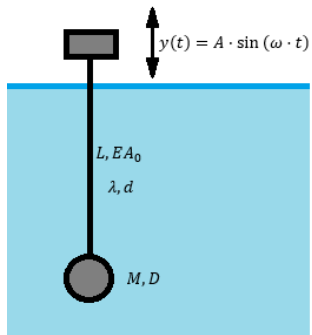
$$\mathbf{F}_M = \rho C_m V \cdot \dot{\mathbf{u}} + \frac{1}{2} \rho C_d A \cdot \mathbf{u} |\mathbf{u}|$$

$$\mathbf{F}_{gb} = (V_u \cdot \rho - m) \cdot g \cdot \mathbf{e}_z$$

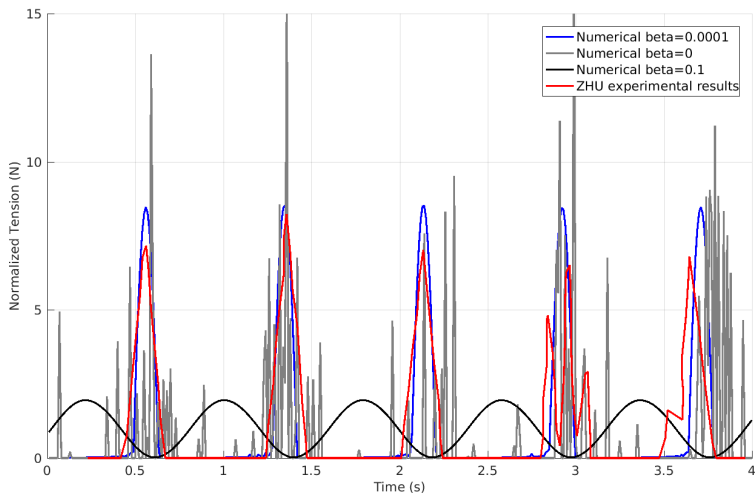
$$\mathbf{F}_T = EA_0 \cdot (\mathbf{e}_1 + \beta \cdot \dot{\mathbf{e}}_1) \cdot \frac{\mathbf{r}_1 - \mathbf{r}_0}{|\mathbf{r}_1 - \mathbf{r}_0|}$$

$$\mathbf{F}_T = EA_0 \cdot \left[(\mathbf{e}_i + \beta \cdot \dot{\mathbf{e}}_i) \cdot \frac{\mathbf{r}_{i-1} - \mathbf{r}_i}{|\mathbf{r}_{i-1} - \mathbf{r}_i|} + (\mathbf{e}_{i+1} + \beta \cdot \dot{\mathbf{e}}_{i+1}) \cdot \frac{\mathbf{r}_{i+1} - \mathbf{r}_i}{|\mathbf{r}_{i+1} - \mathbf{r}_i|} \right]$$

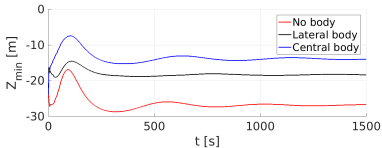
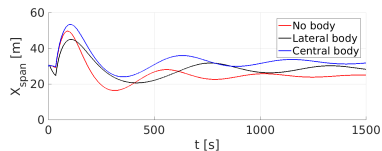
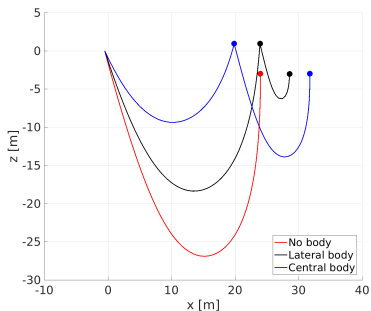
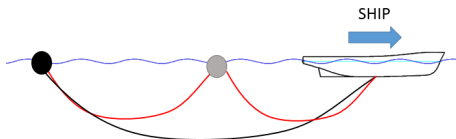
VALIDATION - ZHU'S EXPERIMENT (I)








VALIDATION - ZHU'S EXPERIMENT (II)



APPLICATION CASES - TOWING A FLOATING BODY



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