Federpendel und Planetenbahnen

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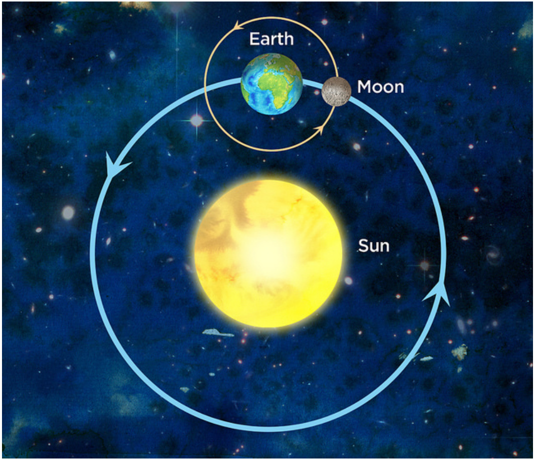
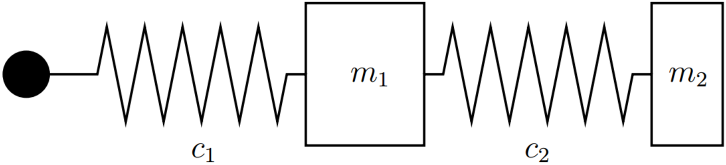


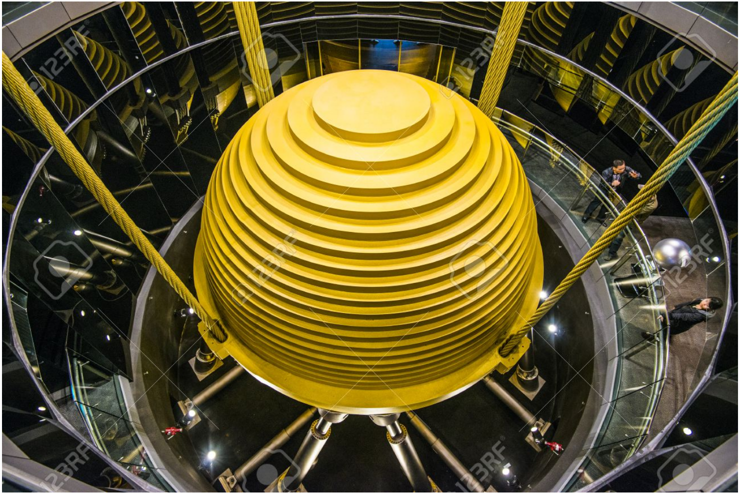
Raterunde - Teil 1

Schwingungstilger



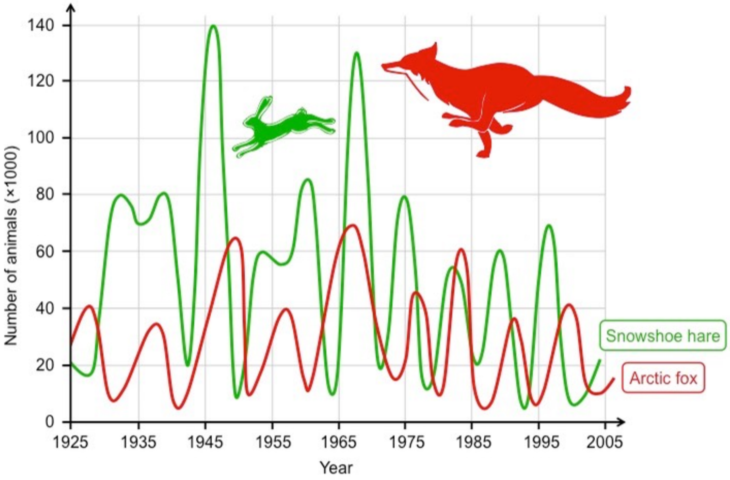
$$m_1 y_1'' = -c_1(y_1 - h) + c_2(y_2 - y_1) - \rho(y_1' - h') + \rho(y_2' - y_1')$$
$$m_2 y_2'' = -c_2(y_2 - y_1) - \rho(y_2' - y_1')$$

Raterunde - Teil 2



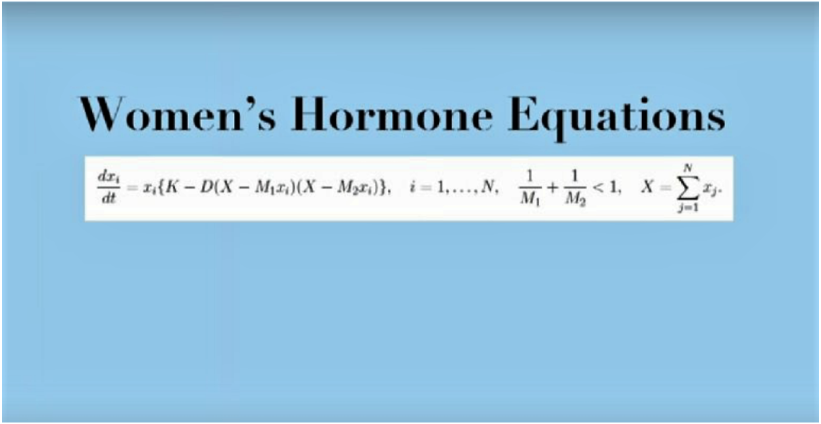
Differentialgleichungen

Räuber-Beute-Modelle



Raumfahrt - Technik

Biologie


Women's Hormone Equations
$\frac{dx_i}{dt} = x_i\{K - D(X - M_1x_i)(X - M_2x_i)\}, \quad i = 1,\ldots,N, \quad \frac{1}{M_1} + \frac{1}{M_2} < 1, \quad X = \sum_{j=1}^{N} x_j.$

Biologie

Men's Hormone Equations

$$\lambda(t) = H_{1,2}\left(\int_{(t-l_{1,2})\vee 0}^{(t-l_{1,1})\vee 0} X_{Te}(r)\,dr, \int_{(t-l_{2,2})\vee 0}^{(t-l_{2,1})\vee 0} X_G(r)\,dr\right), \quad \int_{s-l_2}^{s-l_1} X_A(r)\,dr \overset{\text{def}}{=} \begin{cases} \frac{1}{l_2 - l_1}\int_{s-l_2}^{s-l_1} X_A(r)\,dr, & \text{if } l_2 > l_1 \\ X_A(s-l_1), & \text{if } l_2 = l_1 \end{cases},$$

$$p(s \mid T_G^{k-1}, \lambda(\cdot)) = \gamma \times \lambda(s)\left(\int_{T_G^{k-1}}^{s} \lambda(r)\,dr\right)^{\gamma-1} \exp^{-\left(\int_{T_G^{k-1}}^{s}\lambda(r)\,dr\right)^{\gamma}}, \quad T_L^k = \left[\min_j\left\{T_G^j \mid T_G^j \geq T_L^{k-1} + r_L\right\}\right] + \tau_L,$$

$$N_G(t) = \sum_{j=1}^{\infty} 1_{\{T_G^j \leq t\}}, \quad N_L(t) = \sum_{j=1}^{\infty} 1_{\{T_L^j \leq t\}}, \quad S_G(t) = H_3\left(\int_{(t-l_{3,2})\vee 0}^{(t-l_{3,1})\vee 0} X_{Te}(s)\,ds\right) + \xi_G(t), \quad S_{Te}(t) = H_4\left(\mu(t) \times \int_{(t-l_{4,2})\vee 0}^{(t-l_{4,1})\vee 0} X_L(s)\,ds\right) + \xi_{Te}(t),$$

$$S_L(t) = H_{5,6}\left(\sum_{j=0}^{N_L(t)} \int_{(T_L^j - l_{5,2})\vee 0}^{(T_L^j - l_{5,1})\vee 0} X_G(s)\,ds \times \Gamma(t - T_L^j), \int_{(t-l_{6,2})\vee 0}^{(t-l_{6,1})\vee 0} X_{Te}(s)\,ds\right) + \xi_L(t),$$

$$d\xi_i(t) = -\delta_i \xi_i(t) + \tau_i(S_i(t))\,dB_i(t), \quad \xi_i(0) = 0, \quad \delta_i > 0, \quad i = Te, G, L,$$

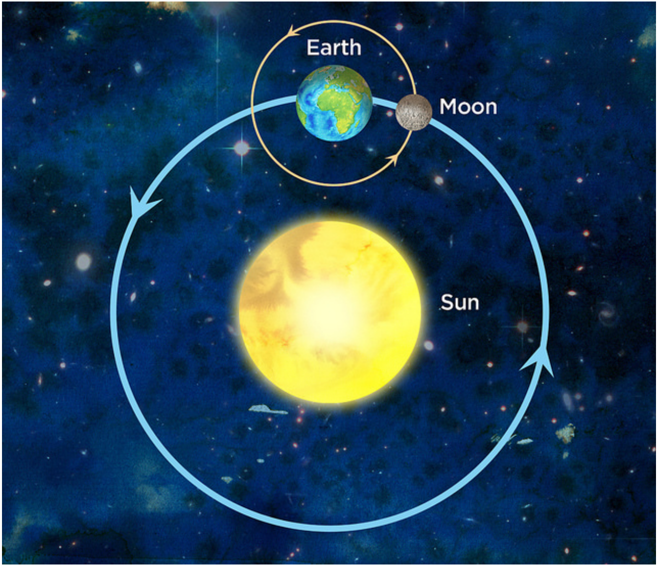
$$A_G^j = \int_{T_G^{j-1}}^{T_G^j} S_G(t)\,dt, \quad A_L^j = \int_{T_L^{j-1}}^{T_i^j} (1 - e^{-\eta(t - T_L^{j-1})}) S_L(t)\,dt, \quad M_i^j = \Psi_i(T_i^{j-1}, T_i^j) \times M_i^{j-1} + A_i^j, \quad i = G, L,$$

$$Z_G(t)\,dt = [\beta_G + M_G^{N_G(t)} \psi_G(t - T_G^{N_G(t)})]\,dt, \quad dX_G(t) = \{-\alpha_G(X_G(t))X_G(t) + Z_G(t)\}\,dt + \sigma_G(X_G(t))\,dW_G(t),$$

$$Z_L(t)\,dt = [\beta_L + M_L^{N_L(t)} \psi_L(t - T_L^{N_L(t)}) + e^{-\eta(t - T_L^{N_L(t)})} + S_L(t)]\,dt, \quad dX_L(t) = \{-\alpha_L(X_L(t))X_L(t) + Z_L(t)\}\,dt + \sigma_L(X_L(t))\,dW_L(t).$$

Planetenbahnen

Planetenbahnen



Drei-Körper-Problem

$$\ddot{\mathbf{x}}_1 = -\frac{Gm_2}{(x_1 - x_2)^3}(\mathbf{x}_1 - \mathbf{x}_2) - \frac{Gm_3}{(x_1 - x_3)^3}(\mathbf{x}_1 - \mathbf{x}_3)$$
$$\ddot{\mathbf{x}}_2 = -\frac{Gm_3}{(x_2 - x_3)^3}(\mathbf{x}_2 - \mathbf{x}_3) - \frac{Gm_1}{(x_2 - x_1)^3}(\mathbf{x}_2 - \mathbf{x}_1)$$
$$\ddot{\mathbf{x}}_3 = -\frac{Gm_1}{(x_3 - x_1)^3}(\mathbf{x}_3 - \mathbf{x}_1) - \frac{Gm_2}{(x_3 - x_2)^3}(\mathbf{x}_3 - \mathbf{x}_2)$$