$$\frac{d\dot{q}_{4}}{dt} = \frac{\left(\left(\frac{1}{4}I_{yy} + \frac{1}{4}I_{zz}\right)\left(-I_{xx}S\left(2q_{5}\right)\dot{q}_{4}^{2} + 2I_{xx}C\left(q_{5}\right)\dot{q}_{4}\dot{q}_{6} - \frac{1}{2}I_{yy}S\left(2q_{5}\right)C\left(2q_{6}\right)\dot{q}_{4}^{2} + \frac{1}{2}I_{yy}S\left(2q_{5}\right)\dot{q}_{4}^{2} - 2I_{yy}S\left(2q_{6}\right)\dot{q}_{4}^{2} - 2I_{yy}S\left(2q_{6}\right)\dot{q}_{4}^{2} + \frac{1}{2}I_{yy}S\left(2q_{5}\right)\dot{q}_{4}^{2} - 2I_{yy}S\left(2q_{6}\right)\dot{q}_{4}^{2} + \frac{1}{2}I_{yy}S\left(2q_{5}\right)\dot{q}_{4}^{2} - 2I_{yy}S\left(2q_{6}\right)\dot{q}_{5}^{2} + \frac{1}{2}I_{yy}S\left(2q_{5}\right)\dot{q}_{4}^{2} - 2I_{yy}S\left(2q_{6}\right)\dot{q}_{5}^{2} + \frac{1}{2}I_{yy}S\left(2q_{5}\right)\dot{q}_{5}^{2} + \frac{1}{2}I_{yy}S\left(2q_{5}\right)\dot$$