

Comparison: TF Plots of Double Pendulum (Calculated in MATLAB and Mathematica)

Model

Double pendulum part of type-A vis for iLCGT
(IM+TM+RM)

Parameters

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%  
%  
% IM RM TM  
l=[ 2.084 2.084 2.084]; % Wire Length  
d=[ 2.1 0.7 0.15 ]*1E-3; % Diameter  
sux=[ 0 0.17 0.125]; % X-Separation of wire & COM  
suz=[ 0 0.03 0.015]; % Z-Separation of wire & COM  
suy=[ 0 0.00 0 ]; % Upper Suspension Point & COM  
sdy=[ 0.003 -0.001 -0.001]; % Lower Suspension Point & COM  
  
mat=[ 'MA' 'C70' 'W' ]; % Material  
m=[ 80 90 10.7 ]; % Mass  
Ix=[ 1.2 4 0.051]; % Moment of Inertia X  
Iy=[ 2.4 4 0.051]; % Moment of Inertia Y  
Iz=[ 1.2 8 0.084]; % Moment of Inertia Z  
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

Plots

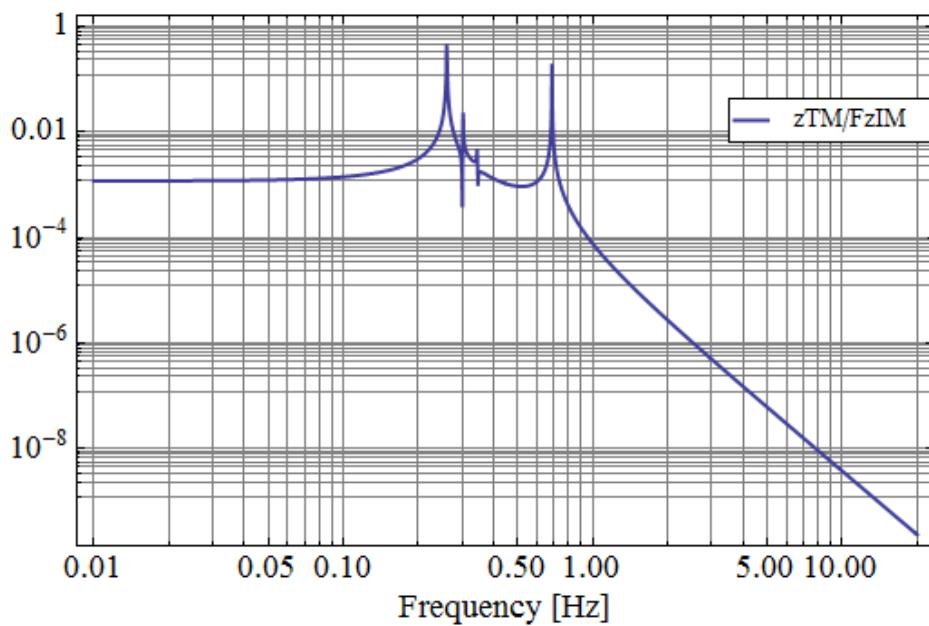
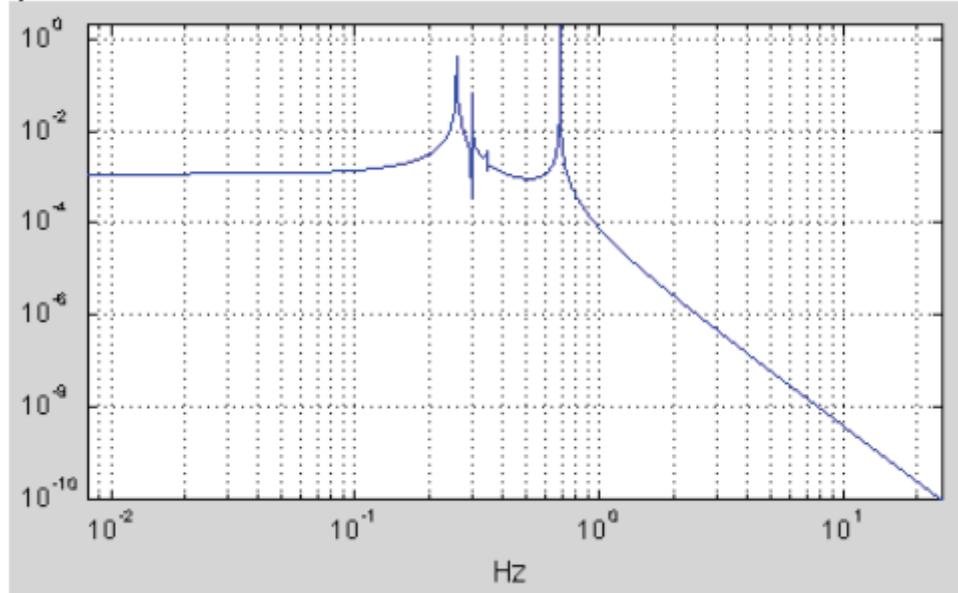
Transfer Functions from IM force/torque to TM displacement (horizontal/pitch)

* Upper Plots: Results from E. Majorana (MATLAB)

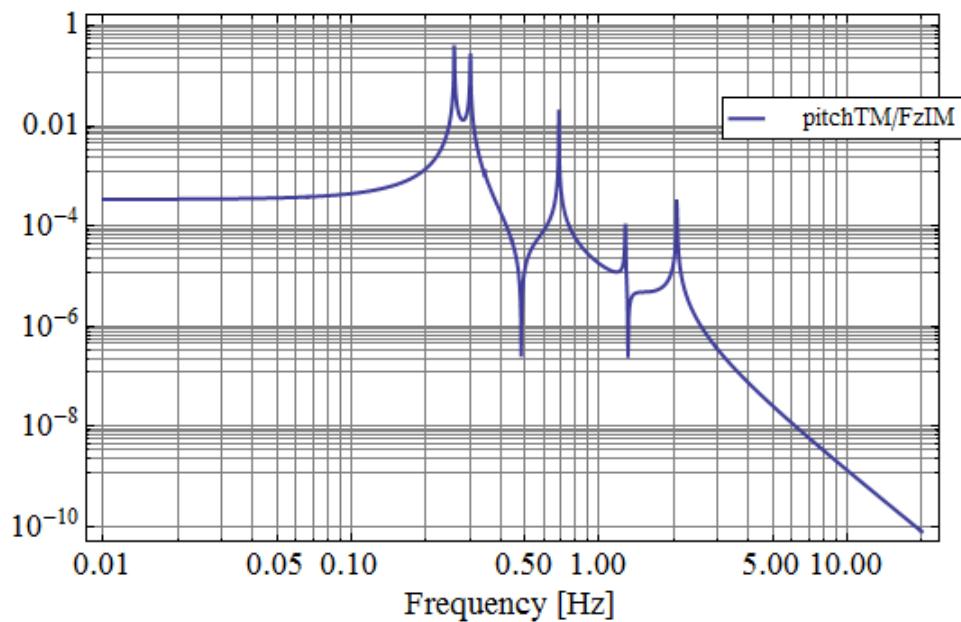
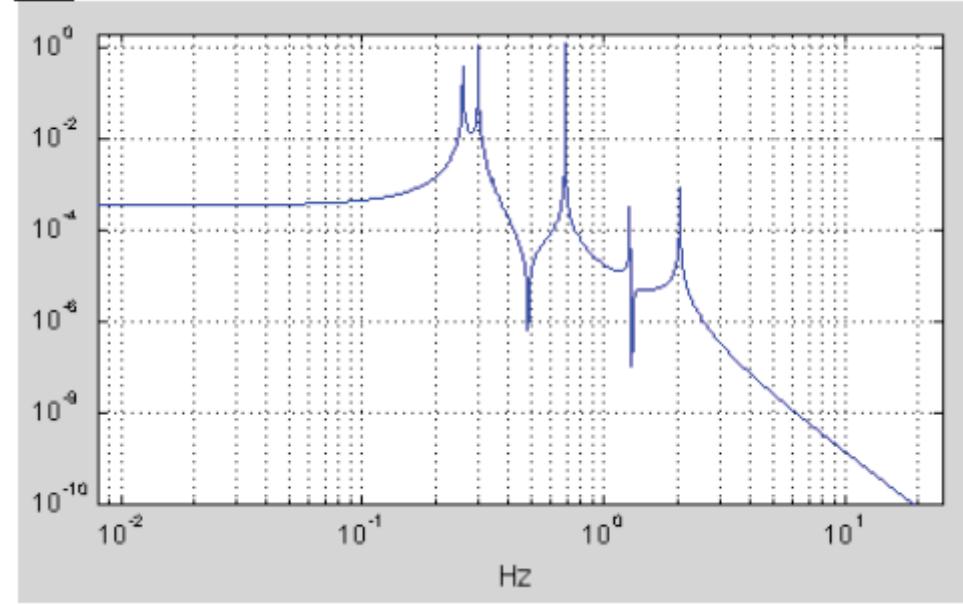
* Lower Plots: Results from T. Sekiguchi (Mathematica)

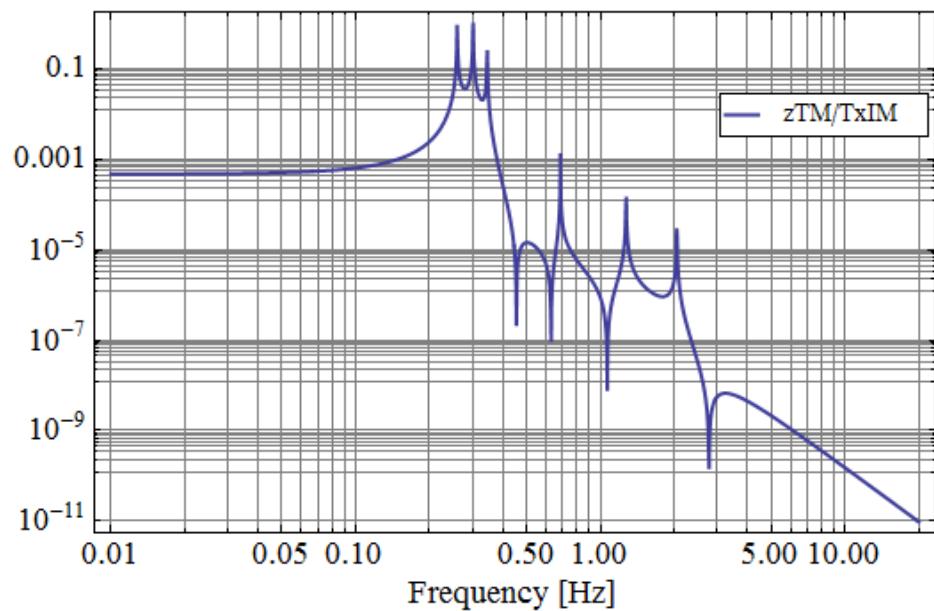
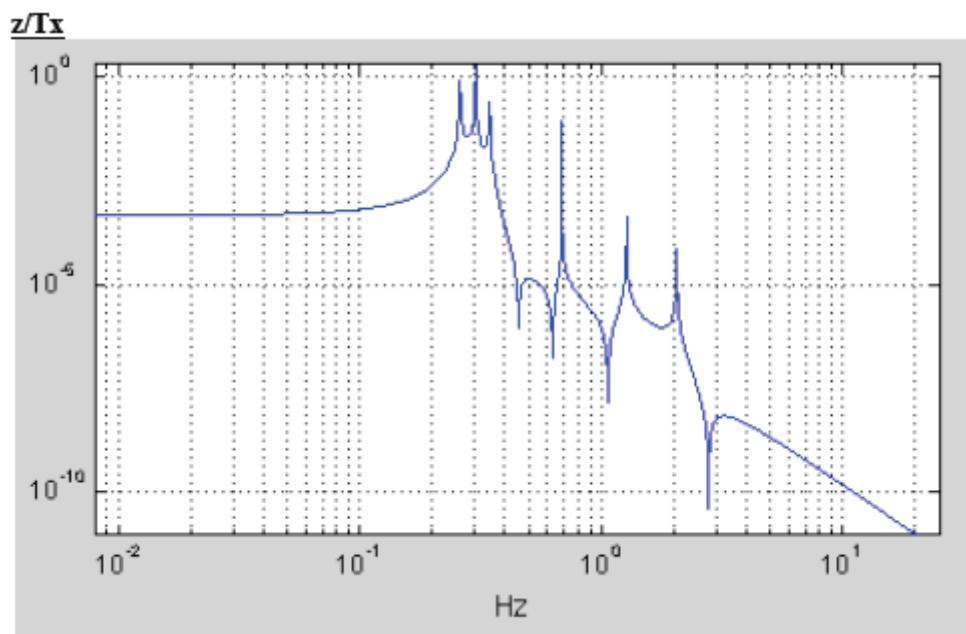
Comparison

z/Fz

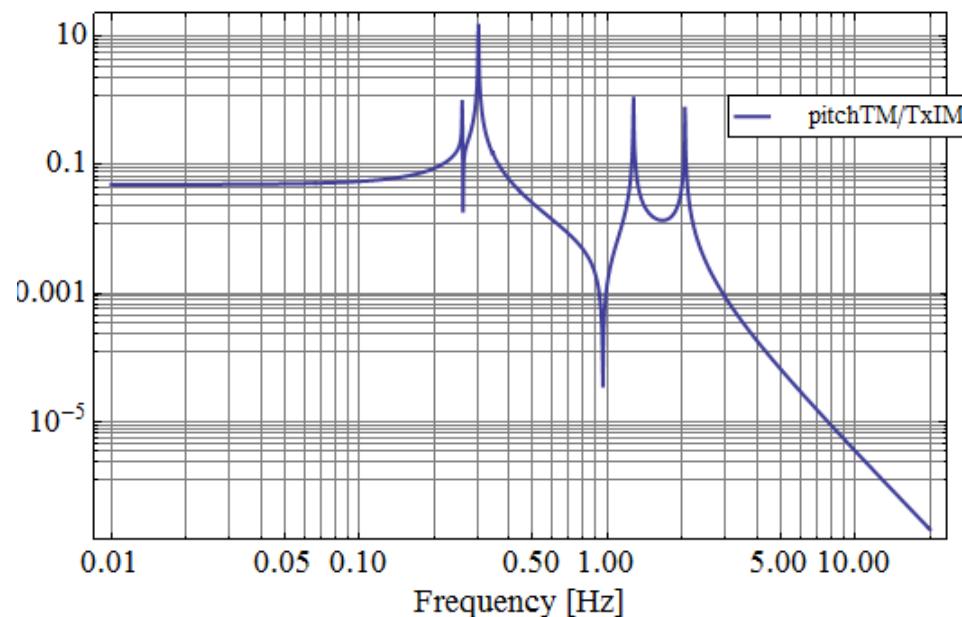
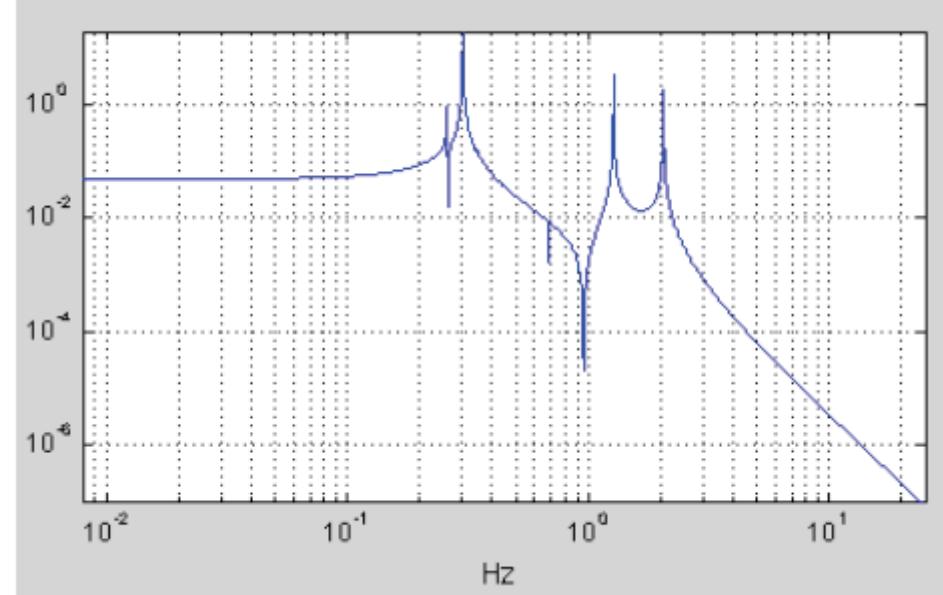


tx/Fz





tx/Tx



The comparison enlightens very tiny differences between two models.