TD_xxx: Matlab code for simulation of floating body motions in the time domain

Andrew Hamilton

Contents

1 Listings **2**

1 Listings

```
function F = SpringDamperTether(body1,bodies,n,name,p_a1,p_a2,
    Spring_Force_Coeffs,Damping_Force_Coeffs)

j = 0;
for i = 1:length(bodies)
name2 = get(bodies{i},'name');
  if(strcmp(name2,name))
    j = i;
  end
end
if(j == 0)
   error('ERROR: Can not find name match in SpringDamperTether');
end

body2 = bodies{j};
```

```
sv1 = get(body1,'sv');
sv2 = get(body2,'sv');

xo1 = get(body1,'x0');
xo2 = get(body2,'x0');
pos1 = sv1(1:6);
vel1 = sv1(7:12);
pos2 = sv2(1:6);
vel2 = sv2(7:12);

[Elongation,ElongationRate,s] = TetherElongations(xo1,pos1,vel1,p_a1,xo2,
    pos2,vel2,p_a2);

F = zeros(1,6);

if(Elongation > 0)  %If ram is fully retracted, tether is slack and no
    force is exerted.
  SpringTension = ppval(Spring_Force_Coeffs,Elongation);
  F(1) = SpringTension*s(1);
  F(3) = SpringTension*s(3);

  DampingTension = ppval(Damping_Force_Coeffs,ElongationRate);
  F(1) = F(1) + DampingTension*s(1);
  F(3) = F(3) + DampingTension*s(3);
end
```