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# Post\_Process\_v4

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## Constants

```
day2sec = 86400;
```

## Extract Necessary Parameters

```
mag_epoch = params.Earth.mag_epoch;  
start_epoch = params.sc.start_epoch;  
R = params.Earth.Rmean;
```

## Calculate Total Energy, Euler Angles, and Attitude Constraint

```
xout = xout';  
E = zeros(1,length(tout));  
eulerAngs = zeros(3,length(tout));  
constraint = zeros(1,length(tout));  
q = zeros(4,length(tout));  
h = zeros(1,length(tout));  
  
I3 = [0 0 1]';  
for lv1 = 1:length(tout)  
    r = norm(xout(1:3,lv1));  
    telasped = tout(lv1)+day2sec*(start_epoch-mag_epoch);  
    h(lv1) = norm(r)-R;  
    ba = EarthMagField(xout(1:3,lv1),telasped);  
    if strcmp(AttType,'DCM')  
        Cba = reshape(xout(7:15,lv1),[3 3]);  
        q(:,lv1) = DCM2Quat(Cba);  
        constraint(lv1) = det(Cba)-1;  
    else  
        Cba = Quat2DCM(xout(7:10,lv1));  
        constraint(lv1) =  
        xout(7:9,lv1)'*xout(7:9,lv1)+xout(10,lv1)^2-1;  
    end  
  
    E(lv1) = Etot(xout(:,lv1),r,Cba,ba,params);
```

```
    [phi, theta, psi] = DCM2Euler321(Cba);  
    eulerAngs(:,lv1) = [phi; theta; psi];  
end  
if strcmp(AttType, 'DCM')  
    wba = xout(16:18,:);  
else  
    q = xout(7:10,:);  
    wba = xout(11:13,:);  
end
```

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