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function dF = LambertFPrimeOfZ( r1m, r2m, dTheta, z )

% Compute the derivative of F(z)
%
%   Given two position vectors, r1 and r2, and the time of flight
%   between
%   them, TOF, find the corresponding Keplerian orbit.
%
%   Inputs:
%       r1m      Magnitude of position vector r1
%       r2m      Magnitude of position vector r2
%       dTheta   Angle between vector r1 and r2
%       z        Universal variable "z"
%
%   Outputs:
%       dF       Derivative of F(z) at z

A = sin(dTheta)*sqrt(r1m*r2m/(1-cos(dTheta)));

if( abs(z)<eps )
    y0 = r1m+r2m-sqrt(2)*A;
    dF = sqrt(2)/40*y0^1.5 + A/8*( sqrt(y0) + A*sqrt(1/2/y0));
else
    S = stumpS(z);
    C = stumpC(z);
    y = r1m+r2m+A*( z*S-1 )/sqrt(C);
    dF = (y/C)^1.5 * ( 1/(2*z) * (C-3*S/(2*C))+3*S^2 / (4*C) ) + ...
        (A/8)*( 3*S/C*sqrt(y) + A*sqrt(C/y) );
end

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