```
function vEcfCorr = vac( vEcf, satPos, satVel );

   meanSiderealRotationRate = 7.292115833000E-05;
   omega = [0 0 meanSiderealRotationRate]';     % earth rotational rate
   speedOfLight = 299792458;                      % meters/second
   meanEarthRadius = 6371000;                   % Mean Earth radius (in meters)
   normSatPos = norm(satPos);
   cosTheta = dot( vEcf, -satPos / normSatPos );
   lambda = normSatPos*cosTheta - ( normSatPos^2 * cosTheta^2 + meanEarthRadius^2 - normSatPos^2 )^0.5;

   satVelRelative = satVel - lambda * cross(omega, vEcf);

   velPerp = satVelRelative - (satVelRelative'*vEcf) * vEcf;
   vEcfCorr = vEcf - velPerp/speedOfLight;
   vEcfCorr = vEcfCorr/norm(vEcfCorr);
```