I'm trying to interpret the meaning of two common "vectors" (magnitude) used in meteor work, V_c and V_{cc}.

An old text I have calculates the negative geocentric velocity vector, corrected for the motion of station A due to the rotation of the earth, as given by:

$$V_c \mathbf{R}^*_c = \mathbf{R}^* - \mathbf{R}'_A$$

It continues by stating that V_c and $\mathbf{R}^*_c$ can be found with the relation

$$V^2_c = V_c \mathbf{R}^*_c \cdot V_c \mathbf{R}^*_c ,$$

where dot equals the scalar product and vectors are in bold. * denotes a unit vector. ' denotes velocity, $\mathbf{R}_A$ derivate with respect to time (geocentric velocity vector of A referred to the equinox). Without it the vector means position. $\mathbf{R}$ is radiant.

This all appears from nothing in the prior pages, but the source is likely Whipple and Jacchia. Their paper is at It's available on a pdf at
<http://www.sil.si.edu/smithsoniancontributions/Astrophysics/pdf_hi/SCAS-0002.pd\f>

However, the second equation looks like it is exactly one.

I've seen the V_c and V_{cc} notation in IMO documentation, but the explanation seems to differ. One by Mike Luciuk seems to have another interpretation. Mention is made of heliocentric vectors.

So are the equations missing something in calculating V_c and V_{cc} , and what's really do these variables represent?