Atmospheric Chemistry and Physics Discussions

Interactive Comment

Interactive comment on "Radar observations of meteor trails, and their interpretation using Fresnel holography: a new tool in meteor science" *by* W. G. Elford

Anonymous Referee #2

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I like this paper very much. I recommend its publications after minor revisions suggested below:

1. Section 2 culminating with the transform equation (3) can be - and should be - considerably shortened. I suggest that eqn (1) be replaced directly by

$$E(t) \propto \int_{-\infty}^{\infty} A(y) e^{j \frac{2k}{R_o}(vt+y)^2} dy$$

after a brief discussion of the geometry and coordinates shown in Fig 1 (since x and vt are identical I suggest that x be dropped in favor of vt). Then a statement like

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"multiplying both sides of (1) by $e^{-j\frac{2k}{R_o}(vt+y)^2}$ and integrating over all t one obtains

$$A(y) \propto \int_{-\infty}^{\infty} E(t) e^{-j\frac{2k}{R_o}(vt+y)^2} dt$$

should be sufficient (from which one can write the present eqn (3) if the author prefers the X, Y, Z notation for the transform).

2. It would be useful to have a slightly more detailed description of the experiment in the beginning of Section 4. For instance, peak power, pulse length, Δr, number of range gates, how the phase is unwrapped from I and Q records.

3. Page 5: "...Transform as shown in Figure 5". Should be Figure 6, I believe.

4. Pages 5 and 6: Please clarify in the text how it is determined whether "to point" is within or outside the beam.

5. The discussion in the last paragraph of Section 4.3 is difficult to follow. It should be clarified.

6. Page 8: "that he extended" should be "that the extended".

7. In Section 5 it would be sufficient to say that "replacing vt by $vt + \frac{1}{2}at^2$, where it is assumed that $at^2 \ll y + vt$, (3) can be generalized as" the equation for $A(y)$ given currently by eqn (9).

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