

Abstract Submitted  
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**Atmospheric Scintillations: A Clue for Bird Orientation and Navigation** CHARLES PETTY, ANDREW BOWDEN, ANDRE BENARD, Michigan State University — The index-of-refraction of the troposphere is anisotropic at all scales even if the local turbulent velocity field is statistically homogeneous. This anisotropy is partly due to the coupling between the fluctuating velocity field with the Coriolis field and the Lorentz field. Thus, the redistribution of turbulent kinetic energy and the concomitant anisotropy in the index-of-refraction may provide a practical means for birds (and other animals and insects) to orient and navigate. Consequently, if birds migrate between two points on the Earth by following a great circle path, then local anisotropic scintillation phenomena may provide a means to determine the latitude, the longitude, and the bearing along an orthodromic migration path. Thus, scintillation phenomena may be an important fundamental component in the underlying mechanics that support bird orientation and navigation.

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