Comment I on ''Generation of focused, nonspherically decaying pulses of electromagnetic radiation''

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(Received 27 January 1999)

Superluminally moving charge distributions of the type considered by Ardavan commonly occur inside waveguides and the radiation emitted by such sources is well known. The application of standard antenna theory shows that Ardavan has overestimated the intensity from typical pulsars by a factor exceeding 10^9.

PACS number(s): 41.20.Jb, 03.50.De, 84.40.Ba, 97.60.Gb

Ardavan [1] has suggested that a new type of radiation, radically different from Cerenkov radiation, is emitted by source distributions rotating uniformly at speeds exceeding the wave velocity. If true, this could be relevant to acoustic noise from supersonic propellers, helicopter rotors, and the radio emission from pulsars. As I have discussed elsewhere [2] charge and current distributions moving faster than c commonly occur inside waveguides and the radiation from them is well known. It is utilized in traveling wave antennas known as leaky waveguides [3]. To model a typical pulsar the waveguide would follow a circle of radius greater than 10^4 km. The leakage could be set to a low value so that the traveling distribution maintained essentially constant amplitude. Application of conventional antenna theory indicates no violation of the inverse square law and shows that in this case Ardavan overestimated the intensity by a factor exceeding 10^9. Commenting on this criticism Ardavan now claims that my analysis [2] can, at best, be merely suggestive. This is not so; I used proven antenna practice. I conclude that Ardavan's theory is flawed. His reference to the Doppler effect (Appendix C) suggests some confusion between group velocity and phase velocity since no radiating charge is actually moving around the circle. It is the relative phases of the oscillations of individual charges which move.

[1] H. Ardavan, Phys. Rev. E **58**, 6659 (1998).
[2] A. Hewish, Mon. Not. R. Astron. Soc. **280**, L27 (1996).
[3] *The Handbook of Antenna Design* (Peregrinus, London, 1982).

