Letter to the Editor

Laser optics and defense

In a recent article in *EIR*'s Science and Technology Section,[1] Mr. R. Gallagher uses some of my work[2,3] in his crusade against what he calls the "optics community" opposition to the Tactical and Strategic Defense Initiative programs (TDI and SDI). It is not my intention to take part in this controversy but, since some of my results were discussed, I would like to comment briefly.

For the most part, the article quotes correctly the findings of my experiment but it extrapolates their significance much beyond my own analysis of Refs. 2 and 3. My experiment is a laboratory simulation performed at a power level that does not alter the target. While I remain fully confident in the validity of my results, they are only indicative of a problem and cannot by themselves justify the type of conclusion developed by Mr. Gallagher. Full-scale experiments in the real atmosphere at powers representative of weapon systems would have to be undertaken. My work raises a valid question but does not provide the universal answer implied by Mr. Gallagher's article. I believe the situation is a lot more complex.

I, of course, do not challenge Mr. Gallagher's right to his own interpretation of published data. I simply object to part of his style which leaves the impression that I concur with his position. In particular, a sentence such as "Bissonnette argues that Fried's definition of coherence length is an artificial construct that . . . does not hold for nature" credits me with a sententious assessment I disagree with, and definitely not extracted from my publications.[2,3]

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The Author Replies

Mr. Bissonette's work has been ignored by the American optics community; they do not recognize the validity of his results. I disagree with them intensely, and uphold the validity of his work, and its consequent relevance to our strategic defense. I apologize if inadvertently I have in any way appeared to attribute my own conclusions to Mr. Bissonnette.

I agree that "full-scale experiments in the real atmosphere at powers representative of weapons system" must be undertaken. Unfortunately, neither the Canadian nor U.S. governments are deliberately funding such experiments to test the validity of Bissonnette's work. However, quite by accident, some tests conducted by the Office of the Strategic Defense Initiative (SDIO) over the past few months, have also shown that laser beam propagation through the atmosphere and imaging a target through turbulence, are not the difficult matters that Mr. Fried imagines them to be, and this constitutes partial confirmation of an extension of Bissonnette's results to militarily significant power levels.

Robert Gallagher

1. R. Gallagher, "Laser Optics for the Defense of Europe and Asia," *Executive Intelligence Review*, Vol. 12, No. 49, pp. 20-27, Dec. 13, 1985.
2. L. R. Bissonnette, "Adaptive Optical System Referencing in the Case of Resolved Targets Illuminated Through Turbulence," *Applied Optics*, Vol. 21, No. 22, pp. 3998-4004, Nov. 15, 1982.
3. L. R. Bissonnette, "Outgoing-Wave Adaptive Optics Systems: Error Sensing Method in the Case of Extended Targets in Turbulence," *Proceedings*, Society of Photo-optical Instrumentation Engineers, Vol. 365, pp. 32-41 (1982).