GENERAL DISCUSSION

Arthur H. Guenther[1]—I have only two short comments to bring to your attention, concerning damage in picosecond laser systems that I received from Dr. G. Gobeli at Sandia Corporation and Dr. Sklizkov from Basov's group at the Lebedev Institute in Moscow. I don't know the specific characteristics of the level at which Dr. Gobeli made his observations; however, in his system, which is fabricated from A-O glass, he has not noticed any damage when he has selected a single pulse, in the mode-locked train, for amplification through his system. However, when inadvertently the complete mode-locked train was passed through the system, he did see considerable damage. This is in agreement with the comments of Sklizkov concerning his system. The system that the Russians have used for their neutron experiment operates characteristically with pulse length in the range of 10^{-11} to 10^{-10} s. Their damage levels on that particular system occur when they exceed a power density of about gigawatt per cm^2. Of course, we know nothing of their glass composition or sufficient details of their system design. That is the only two pieces of information that I have concerning damage in picosecond times.

C. Martin Stickley[2]—Are you sure of that last statement? I mean a gigawatt per cm^2. That kind of peak power at 10^{-11} s is a very small amount of energy.

Dr. Guenther—That is exactly the number I received last week from him at Hartford. They operate their system routinely in the range between 0.5 and 1 gigawatt per cm^2 for long life at picosecond pulse lengths. Their external aperture I think was approximately 45 mm in diameter. I don't have those notes with me, but that is what the aperture of their final stage is.

Dr. Stickley—Is this work published?

Dr. Guenther—Not to my knowledge. It was a personal communication. I agree with your concern, since their reported values are something like 10 to 20 J in 20 to 40 ps which is about 1 J/cm^2. They may have been troubled with back-reflected radiation from the target causing damage at the lower output energy densities.

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