

Question #293

Shown in the photograph at the left below is a demonstration involving a laser, a standard 20cm focal length glass lens, and a white screen.



The laser beam hits the lens near its center and produces reflections off the front and back surfaces, which can be seen, along with the light originating at the laser, in the photograph of the screen at the right above.

If the lens is moved across the laser beam very slowly, as seen in an mpeg video by clicking your mouse on the photograph at the right above, the two reflections will move closer to each other, eventually becoming superimposed. You cannot see what will happen when the two reflections are actually superimposed, because the video stops before that happens. In fact, what happens when the two reflections are superimposed is the subject of this question.

When the lens is moved so that the reflections from the front and the back surfaces are superimposed:

- (a) the spot will be brighter because the two waves add constructively.
- (b) the spot will be dimmer because the two waves add destructively.
- (c) either (a) or (b), it is not possible to know.
- (d) the spot will have a series of bright and dark circles with a bright spot in the center.
- (e) the spot will have a series of bright and dark circles with a dark spot in the center.
- (f) either (d) or (e), it is not possible to know which.
- (g) the spot will consist of a series of parallel light and dark lines.

Click here for [Answer #293](#) after October 22, 2007.

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For questions and comments regarding the *Question of the Week* contact [Dr. Richard E. Berg](#) by e-mail or using phone number or regular mail address given on the [Lecture-Demonstration Home Page](#).