MITOCW | Optics: Fringe contrast - vibrations | MIT Video Demonstrations in Lasers and Optics

SHAOUL EZEKIEL: In our previous demonstrations in two-beam interferometry, we showed some very good contrast in the fringes of the interference path. In this demonstration, we're going to show how easy it is to ruin the contrast in the fringes. The set up we'll use is, again, a Michaelson interferometer. And here it is.

There's the laser. Here's the beam from the laser. Now reflect off this mirror here. And then reflect it, again, by this mirror here, into the Michaelson interferometer. Here is one arm. Here's the other arm.

The output of the interferometer gets reflected off this mirror, into this lens, onto the screen. So now let's take a close look at the screen, and look at the fringes. Now as you can see, the contrast between bright and dark is pretty good which, means the dark is pretty dark, and the bright is as bright as we can-- as we can get it.

Now I'm going to ruin the contrast between the fringes by simply shaking this mirror here. So you can see that the contrast is washed out, due to the fact that the fringes are moving. If I take my hand away, the fringes come back. I can also tap the beam splitter here. And, again, looks as if there's no interference at all, because I'm shaking one of the mounts.

I could also tap the table. And, again, I can wash the fringes out. So the conclusion here is that, if you want to get good contrast between the fringes, make sure that the optical mounts within the interferometer are stable.

Because if they shake, then the fringes would shake, and you get very poor contrast or-- you don't even see any fringes at all. So, then, be careful how you set up an interferometer so that you can get the best contrast possible.