Japanese team fires world's most powerful laser

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GEKKO XII -- at the Osaka University's Institute for Laser Engineering. Credit: KASUGA, Sho

(Phys.org)—A team of researchers and engineers at Japan's Osaka University is reporting that they have successfully fired what they are claiming is the world's most powerful laser. In their paper published in the journal *Plasma Physics and Controlled Fusion* in 2012, the team described their laser and how it works.

The team now reports that they fired the laser (called the Laser for Fast Ignition Experiments [LFEX]) for a very short period of time—a pulse of just a trillionth of a second. But that pulse was a doozy, emitting 2-petawatts of power, or put another way 2 quadrillion watts.

Lasers have come a long way since their humble beginnings in the early 60's, but still work much the same way—light is amplified via a gain medium through pumping and the result is light that is emitted coherently, which allows it to be narrowly focused. This new laser is approximately 300 feet long, taking up most of a large room, but interestingly, because the pulse is of such short duration, it does not need much energy to create the beam, just a few Joules, or as they team notes, not much more than it would take to run a microwave oven for a few seconds—special glass lamps were used to boost the energy of the beam as it passed through. The research team claims also that not only does the laser generate approximately twice as much power as a similar rival laser at the University of Texas, but has approximately 100 times as much energy.

The team reports also that their configuration is only the beginning, they plan to create stronger and stronger lasers with a goal of achieving 10 petawatts. Such lasers, at least for now, are mostly only of scientific interest, to sustain a pulse long enough to be of practical use would require more power than would likely be available, at least for now. A 2 petawatt laser for example, would require more energy to run continuously, than is currently produced by the whole world, thus giant lasers used as weapons to take down aircraft, drones or missiles (or the

Death Star) at great distances are not likely to happen any time soon.

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