

# Popular Science

The future of laser based medicine is now, thanks to this new, reliable and powerful simulation software.

A new simulation software has been created in order to help the medical world evolve into a safe, laser-based environment. In this article we are interested in knowing if the simulation can actually be used in a real application and the surprising approach we use is to measure time.

In the medical world, a lot of treatments are already done with lasers. These treatments can be improved and new treatments can be introduced if we can determine the path taken by the laser light exactly. This is why we use simulation tools. Nowadays, a lot of these tools already exist, but they are usually limited to specific applications. In this article, we will evaluate a new simulation software that is supposed to give better results for almost every application and spoiler, it does. It will also be able to simulate problems that couldn't be addressed with the old technology. Our technique to find out if the computer comes close to reality is to look at time. Lasers are often pulsed, which means that they build up their energy and then send light in a very short time period. To find out if the tool works, we analysed how that energy stretched in time on a known material. Then we tried to reproduce the same effect in a simulation and the effects look promising. In order to achieve these results, we needed to create a material with known and interesting optical properties, an advanced lab that can measure travel time of photons in picoseconds ( $10^{-12}$  s) and a powerful computer to make the simulation. Since the results of the study are quite positive, the next step would be to apply the same steps as before in a real world case.