

EETIMES ONLINE

EEs explain rogue waves

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“For the first time EEs have generated rogue waves in optical fibers and have confirmed the mechanism that generates them, which they say can occur in other media too, including the ocean. “Rogue waves are an apparently random phenomenon that is seeded by noise,” said lead investigator on the project Daniel Solli, a researcher at the University of California at Los Angeles (UCLA) Henry Samueli School of Engineering and Applied Science. “We have shown that noise with the correct properties can foster the generation of one of these rogue waves.”

“Researchers studying a microstructured optical fiber

near the threshold of soliton-based supercontinuum generation observed the generation of rogue waves in the optical fiber, and they began modeling the mechanism. As a result, the researchers have now characterized the proper initial conditions for generating rogue waves in any medium.”

“We show that a particular set of initial conditions are responsible for generating rogue waves,” said Solli. “In our experiment we discovered that we were getting some rare events that were far larger than any of the neighboring pulses, and that led us to explore this connection between this phenomenon and the oceanic phenomenon which has a very similar kind of effect.”

“Now Jalali's team is working on a more detailed model for the U.S. Department of Defense, which is aiming to harness the effect for military applications.”