

TITLE
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Abstract

Optics maintenance allows for focusing the maximum laser beam energy in the National Ignition Facility (NIF). Damage mitigation is an important part of the optics recycle loop. However, it requires predicting which damage sites are most likely to grow large enough to degrade optical performance. Currently, the sites with the equivalent circular diameter (ECD) above a certain threshold are mitigated even though this measure is not directly related to growth likelihood. Therefore, to save time and cost of unnecessary mitigations it would be useful to have a method to predict growth more precisely. In this work, computer vision techniques were used to extract high level details from Laser Confocal Images (LCI) of damage before and after a subsequent laser shot. This information was then fed into a hybrid state-of-the-art deep learning network to provide a highly accurate growth prediction model, likely better than the current method.

Program Description

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