# Article information:

Ultrafast pulsed laser stealth dicing of 4H-SiC wafer: Structure evolution and defect generation - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S1526612522004492?via%3Dihub>

# Article summary:

1. Investigated the structural evolution and defect formation mechanisms during stealth dicing of 4H-SiC with femtosecond and picosecond lasers.

2. Studied the laser intensity dependence of the nonlinear refractive index, the propagation of laser beam focusing in 4H-SiC, the laser absorption, electron concentration evolution and energy deposition.

3. Femtosecond laser stealth dicing had higher processing accuracy due to minimal thermal effects while picosecond laser processing resulted a higher processing efficiency under the same laser energy density.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article “Ultrafast pulsed laser stealth dicing of 4H-SiC wafer: Structure evolution and defect generation” is an informative piece that provides a comprehensive overview of the structural evolution and defect formation mechanisms during stealth dicing of 4H-SiC with femtosecond and picosecond lasers. The article is well written and provides detailed information on various aspects such as laser intensity dependence, propagation of laser beam focusing in 4H-SiC, laser absorption, electron concentration evolution, energy deposition, etc. The article also discusses two significant processing factors such as laser fluence and scribing times which are important for understanding ultrafast pulsed laser interaction with 4H-SiC wafer.

The article is reliable as it provides evidence for its claims by citing relevant research papers from credible sources. It also uses finite element method to calculate the propagation paths and energy deposition of femtosecond and picosecond lasers in the internal processing of 4H-SiC which adds credibility to its findings. Furthermore, it discusses both advantages and disadvantages associated with each type of ultrafast pulsed lasers which makes it an unbiased source of information.

However, there are some points that could be improved upon in this article such as providing more details on possible risks associated with using ultrafast pulsed lasers for wafer processing or exploring counterarguments to its claims more thoroughly. Additionally, there could be more discussion on how different parameters affect the quality of processed wafers which would make this article even more comprehensive.

# Topics for further research:

* Ultrafast pulsed laser processing risks
* Finite element method for laser processing
* Laser fluence and scribing time optimization
* Defect formation mechanisms in 4H-SiC
* Laser absorption in 4H-SiC wafers
* Energy deposition in ultrafast pulsed laser processing

# Report location:

<https://www.fullpicture.app/item/d8b00ce6c86e45b33e558c9f75141b97>