Color center formation and doping of semiconductors with ion pulses from laser acceleration

Thomas Schenkel, Wei Liu, Kaushalya, Ariel Amsellem, Qing Ji, Arun Persaud, Lawrence Berkeley National Lab; Walid Redjem, Boubacar Kante, UC Berkeley
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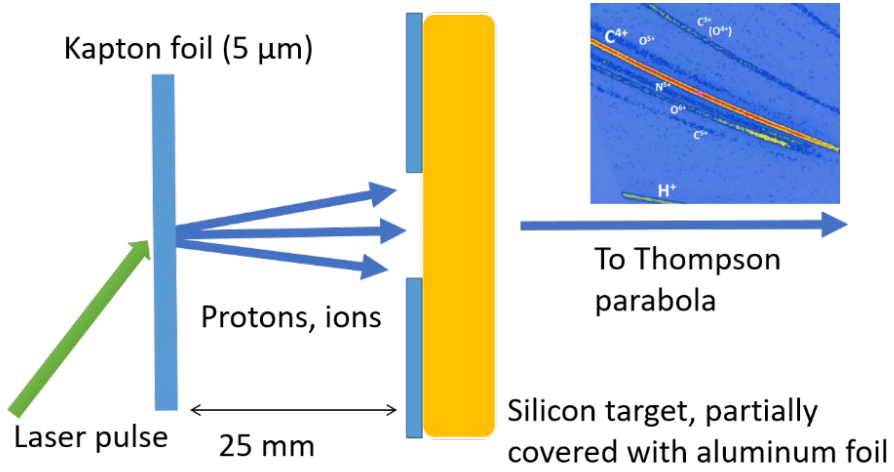

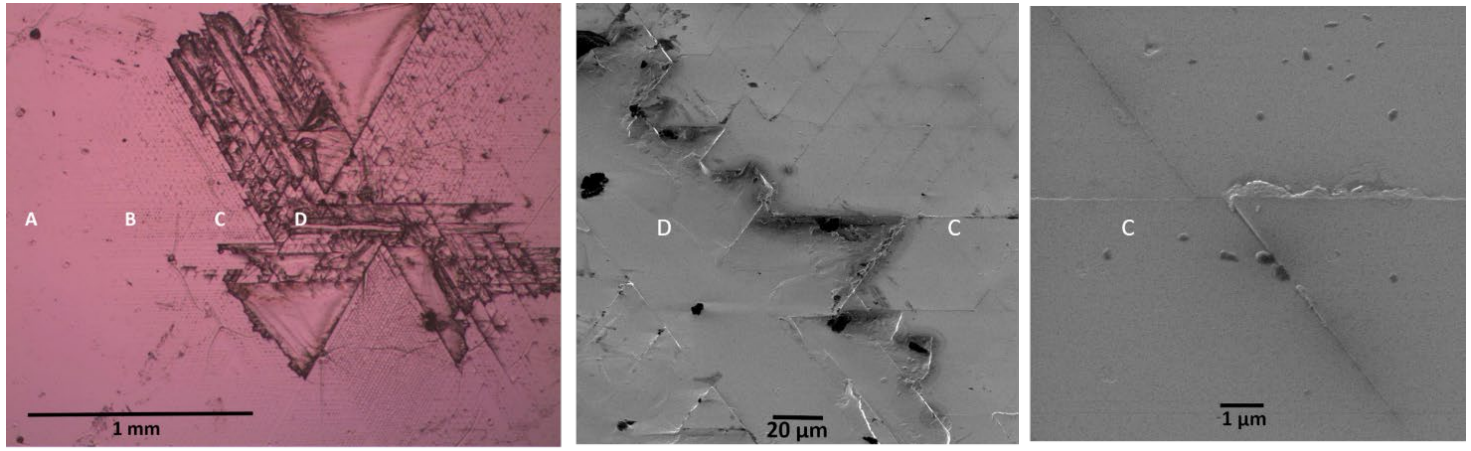

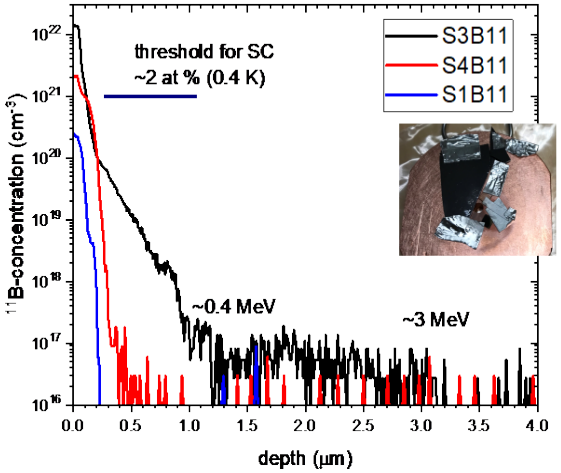

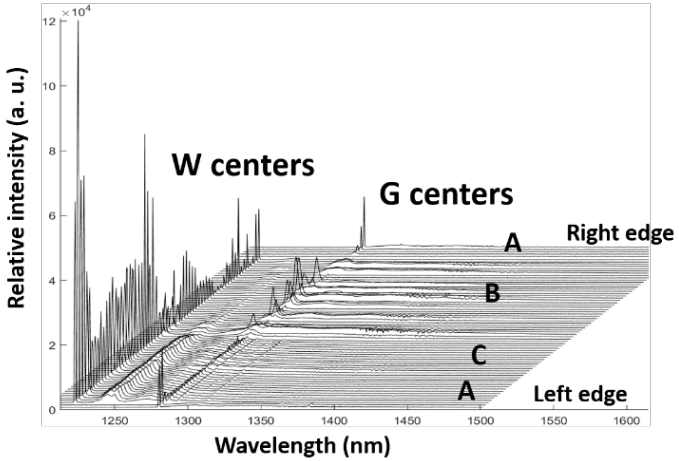

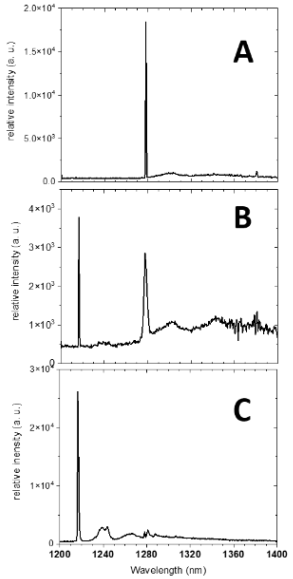

- Short (~10 ns) ion pulses from laser acceleration at BELLA and Phelix simultaneously damage, implant and anneal silicon samples with ion flux levels up to 10^{21} ions/cm^2/s.
- We observe stress fractures and exfoliation of silicon in high flux areas from single ion pulses.
- Color centers, predominantly W and G-centers, form directly in response to proton and ion pulses without a consecutive thermal annealing step.
- We observe boron doping of silicon up to concentrations of 2 to 25 at %. Analysis of electrical properties is in progress.
- Intense, short ion pulses enable new forms of defect engineering and (quantum) materials synthesis.

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