

Company Information

Tech Explore, LLC
5273 College Corner Pike No. 12
Oxford, Ohio 45053

Current SiC work sponsored by AFRL SBIR program – Photoconductive Semiconductor Switch. Collaboration with Virginia Commonwealth University

Expertise

- SiC hydrogen polishing to 1650°C
- Structural characterization – AFM, XRD
- Electrical characterization – Temperature Dependent Hall, C-V, IV, IVT, DLTS
- Optical characterization – PL, Time Resolved PL, photocapacitance
- Passivation – AlN, SiN, etc. thin film
- Epitaxy – III-Nitride MBE, MOCVD
- Semiconductor Device Fabrication

Previous Accomplishments

- Optimized annealing conditions for 6H and 4H SiC
- Anneal eliminates surface polish damage, achieves step and terrace structure
- **PCSS switch device results: 200A at 1.5kV, 30 nJ. 100A, 2.5kV measurement apparatus limited**

Contact Information

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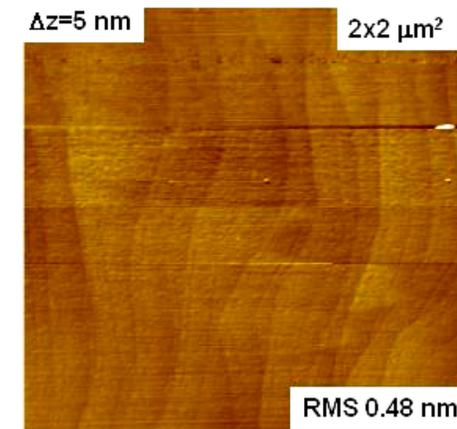
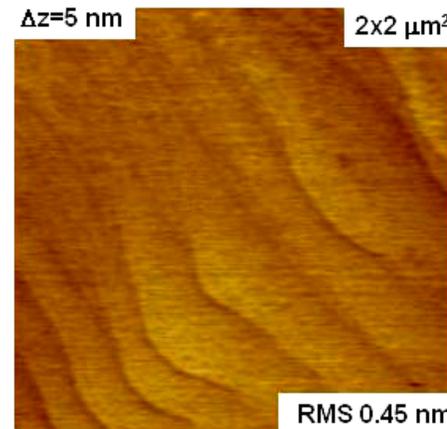
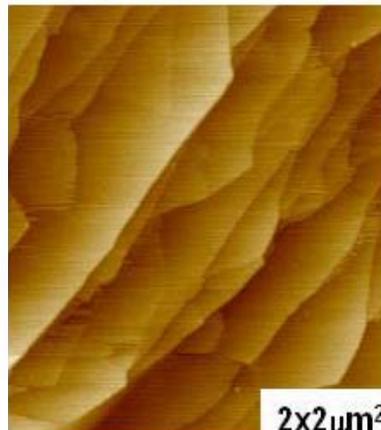
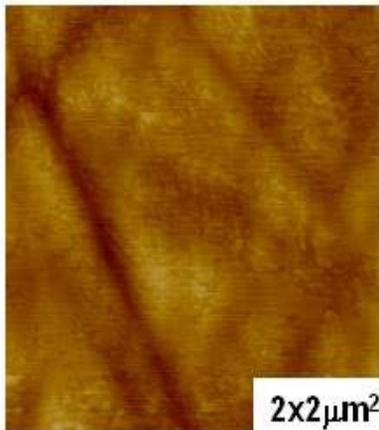
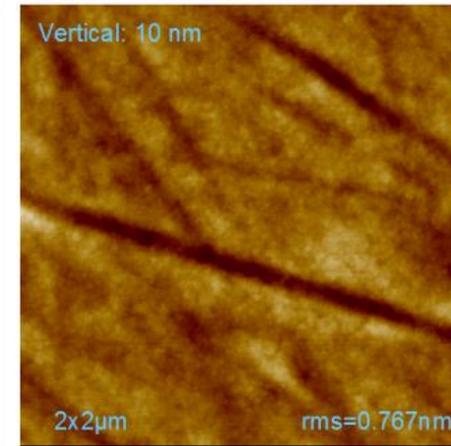
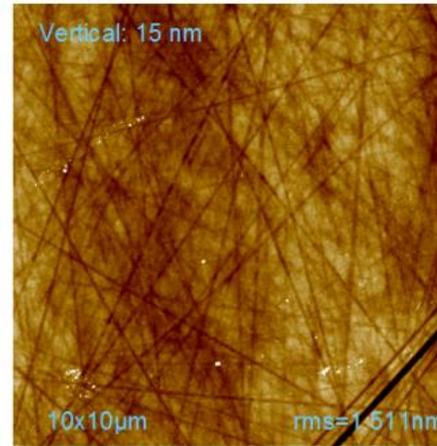
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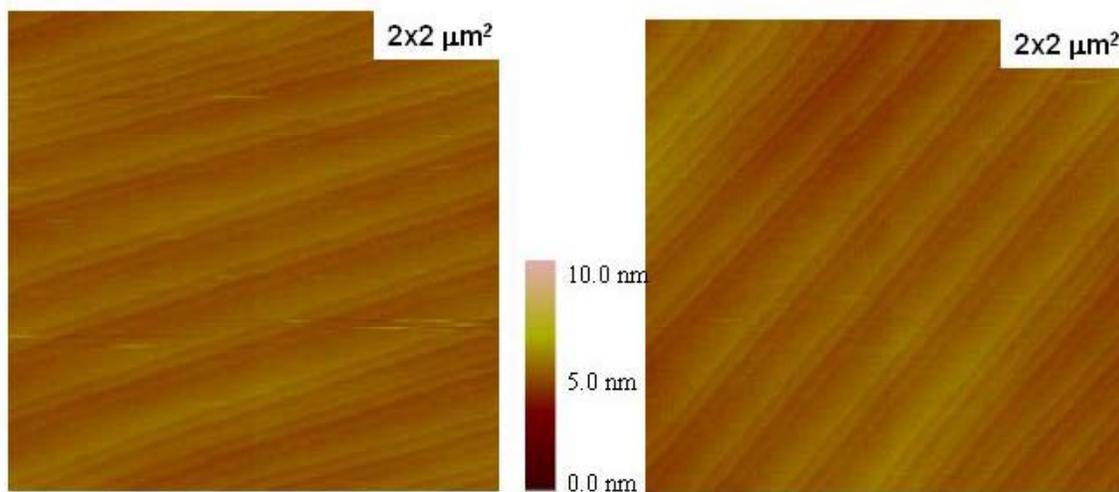
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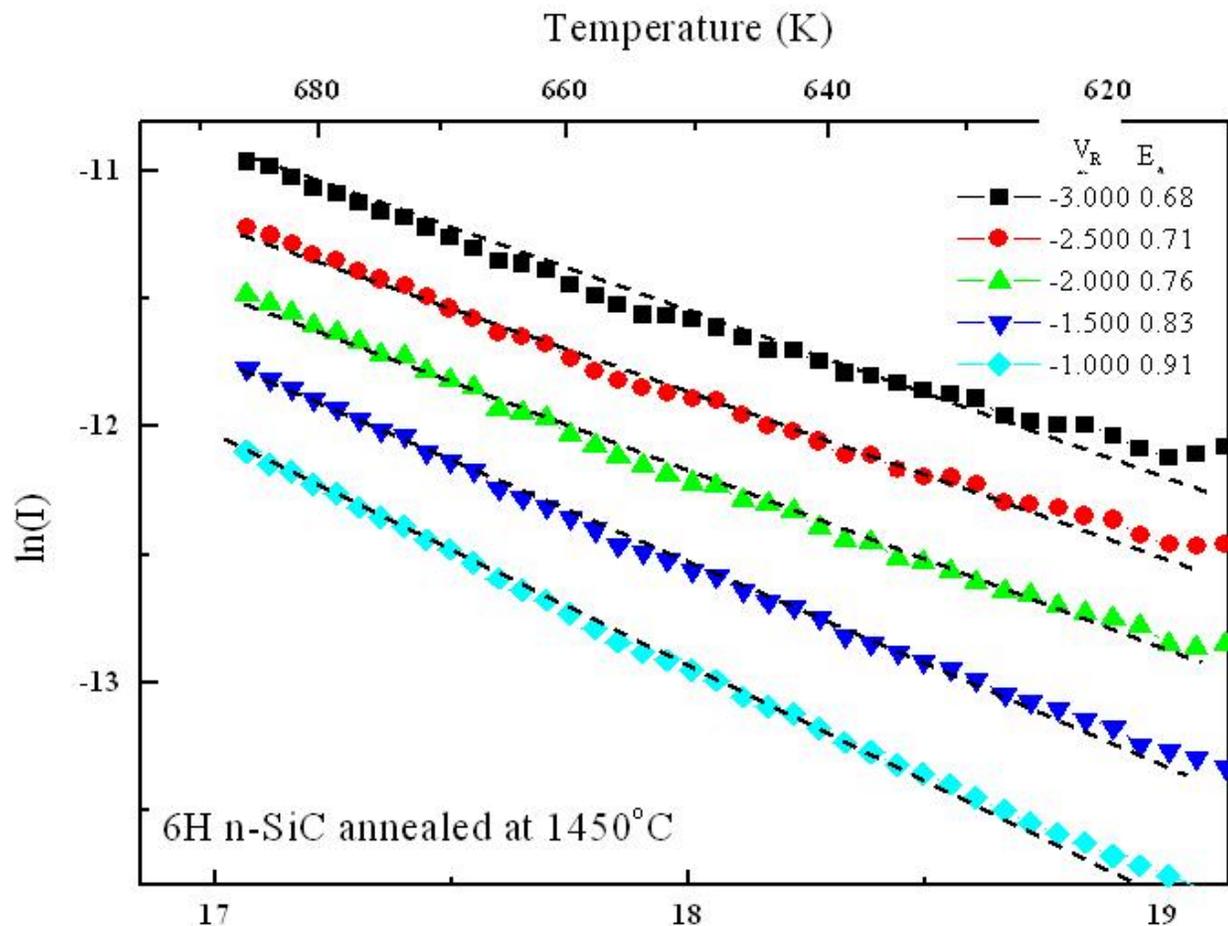
- As-received 6H-SiC
- Annealed at successively higher temperatures





- Hydrogen annealed high purity 4H SiC – atomic layer terraces and steps

- I-V-T – reverse bias leakage from generation center or TE over Schottky
- Poole-Frenkel effect – reduced emission energy with increased electric field strength indicates Coulombic potential profile or Schottky barrier lowering



- Tested at various laser modulation rates
- Rise and fall times of 5ns, 15ns may be limited by laser
- 1500 Volts, 200 Amps
- Will increase by preventing air breakdown – separating contacts, insulating wires.

