SESSION 10a:
MATERIALS: GaN EPI
Chairs: Judy Kronwasser, *NOVASiC*
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This session reviews recent progress in the development of GaN HEMTs and diodes on a variety of epitaxial materials.

The first paper, presented by Veeco, looks at the use of low-cost silicon as the substrate for AlGaN/GaN HEMTs. They describe the layers of the heterostructure MOCVD growth that result in crack-free pseudomorphic growth on 150 mm silicon. They present the quality of the AlGaN barrier and the 2DEG performance.

In the next paper, Temasek Laboratories, et. al. of Singapore presents their study of the uniformity of sub-micron gate AlGaN/ GaN HEMTs on quarter 200 mm silicon wafers. They conclude that their demonstrated results show the feasibility of achieving high uniformity on full 200 mm silicon wafers, for low-cost, high-power switching device applications.

The next two papers in this session are from collaborations between M/A-COM Technology Solutions and laboratories affiliated with MIT. They describe the development of two- and three-terminal high-voltage/high-current switching devices utilizing GaN on silicon. The first of these two papers describes the improvement of breakdown voltage for HEMT devices built on GaN on silicon, looking at the effect of gate-to-drain spacing and field plate design on both normally-off and normally-on devices. Results for GaN on silicon are compared to those for other materials. The second of these papers reports double-field-plated Schottky diodes with up to 5000-V reverse breakdown voltage developed under a program sponsored by the U.S. Department of Energy.

The session concludes with a student paper from the University of Notre Dame. This work compares the results of GaN Schottky diodes on bulk GaN substrates with GaN on sapphire, specifically looking at the effect of dislocations on reverse leakage current and breakdown.