



# Mathematical Sciences 2025 Colloquium Series

**Dr. Kenneth Duru**, Assistant Professor, The University of Texas at El Paso.



November 14, 2025, at 3:00pm  
Bell Hall, Room 130 and online  
via Zoom *Scan the QR-code to access  
the link.*



## On the Stability of the Perfectly Matched Layer (PML) for Propagating Waves

Effective domain truncation is crucial to accurate numerical solution of most wave propagation problems. When stable, the perfectly matched layer (PML) provides a convergent approach by increasing layer width or damping. However, stability issues pose significant challenges. The stability analysis of the PML for hyperbolic wave problems is an active research area. The talk summarizes progress in mathematical, numerical, and practical aspects, identifies open problems, and discusses future directions. Numerical experiments support the theoretical findings and demonstrate real-world applications. Additionally, efficient, stable, and parallel PML implementations in high-performance computing reduce the computational domain needed in seismology, significantly decreasing resource requirements—up to 96% savings in a three-dimensional benchmark problem.

Hosted by: Dr. Emil Schwab

For further information, please contact Dr. Emil Schwab, [eschwab@utep.edu](mailto:eschwab@utep.edu)