Evan Randles* (erandles@colby.edu) and Huan Bui. A generalized polar-coordinate integration formula with applications to local (central) limit theorems and operator semigroups.

The classical polar-coordinate integration formula is an essential tool in harmonic analysis and, especially, the analysis of radial functions in $\mathbb{R}^d$. In this talk, we discuss a generalization of the polar-coordinate integration formula where integration with respect to spherical measure $d\theta$ over the unit sphere $S^{d-1}$ is replaced by integration with respect to a certain surface-carried measure $d\sigma$ over a compact (non-smooth and non-convex) hypersurface $S$ and where the isotropic dilation $x \mapsto r \cdot x$ is replaced by a generally anisotropic dilation $x \mapsto T_r x$. Using oscillatory integral techniques, we will then discuss applications of this work to local (central) limit theorems and operator semigroups. (Received September 14, 2020)