Orimar Sauri

On the Divergence and Vorticity of Vector Ambit Fields

With O.E. Barndorff-Nielsen and Jürgen Schmiegel

In this talk, limit theorems for line integrals of a class of 2-dimensional ambit fields are presented. We show that the asymptotic behaviour of such functionals, termed as the *flux* and the *circulation*, depends entirely on the roughness of the background driving Lévy basis and the ambit set involved. More specifically, when the background driving Lévy basis has unbounded variation, we show that under proper normalization, the flux and the circulation converge stably to certain stationary random fields that are defined as line integrals of a Lévy basis. Additionally, the control measure of such a Lévy basis is the 1-dimensional Hausdorff measure. Furthermore, in the case when the background driving Lévy basis is of bounded variation, the limiting fields corresponds to the classical divergence and vorticity of the underlying field. As an application of our results, we introduce a class of purely spatial $\mathbb{R}^2$-valued isotropic ambit fields that are rotational and have the property of incompressibility.