1146-65-514 **Max Gunzburger**, **Buyang Li** and **Jilu Wang*** (jwang@math.msstate.edu). *Convergence of numerical solutions for stochastic partial integro-differential equations driven by the space-time white noise.*

The stability and convergence of numerical solutions for the stochastic partial integro-differential equation

$$\partial_t\psi - \Delta\partial_t^{1-\alpha}\psi = f + \varepsilon\dot{W}$$

is considered in a convex polygon/polyhedron $\mathcal{O} \subset \mathbb{R}^d$, $d \in \{1, 2, 3\}$, where $\partial_t^{1-\alpha}\psi$ (for given $\alpha \in (0, 1) \cup (1, 2)$) denotes the Caputo fractional derivative/integral, $f(x, t)$ a given deterministic source function, ε a given positive parameter, and $\dot{W}$ space-time white noise. For the above model, both the time-fractional derivative and the stochastic process result in low regularity of the solution. Hence, the numerical approximation of such problems and the corresponding numerical analysis are very challenging. In this work, the stochastic partial integro-differential equation is discretized by a backward Euler convolution quadrature in time with piecewise continuous linear finite element method in space. Sharp-order convergence, up to a logarithmic factor, is established in general d-dimensional spatial domains. Numerical results are presented to illustrate the theoretical analysis. (Received January 29, 2019)