

## Martin Hutzenthaler

When mobility is not enough to make up for competition

### **Abstract:**

In a spatial super-critical branching process with competition, ability of long range migration can help to survive. We consider the limit of long range uniform migration when the range tends to infinity. At time zero all islands are empty except for one. The limit is a tree of excursions in which each migration event causes a colonisation of an empty island. Due to the tree structure, we obtain a simple criterion when the total mass of all islands tends to zero as time tends to infinity. In particular extinction is possible even for the most mobile migration. In addition the tree of excursions dominates the associated spatial branching process with competition on each island. Applying this comparison result yields a global extinction condition for systems of locally regulated interacting diffusions.