# Linear-fractional branching processes with countably many types

*Serik Sagitov, serik@chalmers.se*

Mathematical Sciences, Chalmers University of Technology and University of Gothenburg, 412 96, Sweden.

**Keywords:** Galton-Watson processes with infinitely many types, Perron-Frobenius theorem for countable matrices, R-positive recurrence

**AMS:** 60J80

**Abstract**

This paper is devoted to a special class of the Galton-Watson processes with a countable type space whose probability generating functions are linear-fractional. For such processes using various tools (contour process, spinal representation, Perron-Frobenius theorem for countable matrices, renewal theory) we obtain a transparent criterion for R-positive recurrence with respect to the type space.

**Acknowledgements:** The research was supported by the Swedish Research Council grant 621-2010-5623.