

A QUASI-SKIP-FREE PROCESSES WITH "QUASI" PRODUCT FORM STATIONARY DISTRIBUTION

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In this talk we will discuss QSF (Quasi-Skip-Free) processes. These are a generalisation of QBD (Quasi-Birth-Death) processes, where transitions are allowed across several levels in one direction. In particular, we will study so-called skip-free to the left processes that are bounded to the right. We assume that each level of the QSF process contains one exit state. This means that each level contains precisely one state with a positive jump rate to the next lower level.

This implies that jump matrix to the next lower level contains only single non-zero row. Under homogeneity and irreducibility assumptions, we will show that there exists an invariant measure which is of product form as a function of the level. In the case of an ergodic process, the stationary distribution has this product form property.

We will discuss several applications, such as $PH/M/1$ and $PH/M/1$ -batch service queues.