ON MATRIX-EXPONENTIAL APPROXIMATIONS OF LADDER DISTRIBUTIONS FOR SPARRE-ANDERSEN PROCESSES, AND AN APPLICATION TO RISK NETWORKS

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This paper is motivated by recent work on risk networks, which requires approximating the distribution of ladder pairs of Sparre-Andersen processes with phase-type claims. By a well-known duality result, this coincides with that of the (busy, idle) pair for Ph/G/1 queues.

While several approximations for the (busy, idle) pair have been provided in the past, our risk application requires matrix-exponential approximations, and these have been considerably less studied. We provide such approximations in the cases of exponential and second order phase-type claims.