

PAIRWISE APPROXIMATION FOR *SIR* TYPE NETWORK EPIDEMICS WITH NON-MARKOVIAN RECOVERY

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In this talk the generalised mean-field and pairwise models for non-Markovian epidemics on networks with arbitrary recovery time distributions are presented. We consider a hyperbolic system, where the population of infective nodes and links are structured by age since infection. By solving the partial differential equations, the model is transformed into a system of integro-differential equations, which is analysed both from a mathematical and numerical point of view. The asymptotic behaviour of the generalised model is analytically studied and a rigorous mathematical proof of the conjecture on the functional form of the final epidemic size and pairwise reproduction number is provided. As an illustration of the applicability of the general model known results for the exponentially distributed and fixed recovery time cases are recovered and new pairwise models with gamma and uniformly distributed infectious period are obtained. The proposed general framework shows a more complete picture of the impact of non-Markovian recovery on network epidemics.