A GSPT APPROACH TO EPIDEMICS ON HOMOGENEOUS GRAPHS

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We begin this talk by introducing the basic dynamics of epidemics on homogeneous graphs [1].
We then build on the SIR model proposed in [1] by allowing recovered individuals to become susceptible again at a small rate $\epsilon\delta$: this choice introduces a distinction between fast and slow processes.
We introduce the so called "pairwise approximation", which lets us reduce the complexity of the model by only looking at nodes and edges.
Lastly, we look at the $\epsilon \to 0$ limit system, deduce from it information on the system with $\epsilon > 0$ small enough, and present some numerical simulations.

References

[1] Kiss, István Z., Miller, Joel, Simon, Péter L. (2017). *Mathematics of Epidemics on Networks*. Cham: Springer. 2017;598

[2] Kuehn, C. (2015). *Multiple time scale dynamics* (Vol. 191). Berlin: Springer.