東北大学大学院情報科学研究科
純粋・応用数学研究センター

情報数理談話会のお知らせ

日　時： 2023年12月18日㊐ 10:45 より 11:45 まで
場　所： 東北大学大学院情報科学研究科棟 2階 207 中講義室

講演者： 謝穎（Xie, Ying）氏 (東北大学大学院情報科学研究科)
題　目： Population dynamics models on the relation of social nature to the epidemics: On the disease transmission with multiple strains
（感染症伝染ダイナミクスに対する社会特性の関係についての個体群動態モデル：複数株による感染症伝染について）
備　考： この情報数理談話会は課程博士予備審査会を兼ねています

[概 要] Numerous studies have provided evidences of the superinfection with multiple strains about various infectious diseases such as malaria, SARS-CoV-2, dengue, and HIV. Such strains are clearly under the exploitative competition for the host and for the reproduction in the host. Moreover, even when an individual is infected by a hardly detectable novel or mutant strain, the superinfection of another detectable strain could serve the infected individual to be diagnosed and quarantined, which in turn may help to suppress the disease spread. In this work, we consider a mathematical model on the epidemic dynamics of a disease transmission with n strains which follows an order of the competitive dominance according to the infection success in the host. In our model, when no superinfection occurs, the disease becomes eliminated or alternatively the endemic state arises with only the strain which has the largest basic reproduction number while all the other strains get eliminated. We are focusing on the dependence of the endemic/epidemic size on the distribution of the detectabilities of multiple strains, and trying to discuss further the influence of superinfection on the endemic/epidemic size by the analysis on our model.

ホームページ：https://www.math.is.tohoku.ac.jp/research/colloquium.html