Impact of commuting in epidemic invasion threshold DUYGU BALCAN, ALESSANDRO VESPIGNANI, Center for Complex Networks and Systems Research, School of Informatics and Computing, Indiana University, Bloomington, IN 47408, USA — Structured metapopulation models constitute one of the main approaches to the modeling of epidemic spread. While the contagion dynamics in each subpopulation is realized in a coarse-grained scheme, these models rely on the integration of multi-layered mobility data and accurate representations of human movements in different scales. Different scales are not just embedded in the spatial component of the process (long-range versus short-range movements) but also in the duration of the trips (long versus short visits). In this context, commuting, the daily movement of people between home and workplace or home and school, is one of the essential ingredients in multi-scale mobility networks. We consider an SIR-epidemic in a metapopulation system whose subpopulations are coupled by commuting. We investigate analytically and numerically the global epidemic invasion threshold.