
SOE 1: Robustness in Socio-Economic Systems (Invited Talk Hans Herrmann)

Time: Monday 9:30–10:15

Location: GÖR 226

Invited Talk SOE 1.1 Mon 9:30 GÖR 226
The robustness of complex networks — •HANS HERRMANN —
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The Internet, protein interactions or social organizations are examples for complex networks. Such networks typically cease to be operational when they fall apart in disconnected pieces. This can be desired as in the case of criminal networks or should be avoided for instance in the case of communication systems. Destruction can happen randomly or due to a malicious attack. I will present various strategies of optimizing

the robustness of networks preserving some of their properties as for instance their degree distribution. Artificial networks like the Apollonian network can serve to systematically investigate the optimization process. The optimized networks exhibit a novel “onion-like” topology. Applications to power networks, botnets, road systems and brain models will be discussed. Particularly dramatic failures occur when two networks are coupled, like for example the electric grid and the communication network. The abruptness in the connectivity at collapse can be attenuated through autonomous nodes and I will discuss strategies to optimize the choice of these nodes.