Exercises for the lecture

Collaborative transmission in wireless sensor networks

4 Asymptotically optimal approaches and mobility of nodes

4.1 An asymptotically optimal approach

In the lecture an asymptotically optimal approach to feedback based distributed adaptive transmit beamforming was discussed. Derive the asymptotic runtime of this method.

4.2 Mobility of nodes

When receive or transmit nodes are not static, the synchronisation for feedback based distributed adaptive beamforming is impaired.

a) Discuss the impact of mobility on the synchronisation process

b) Assume that for a duration of 6000 iterations a maximum relative phase offset among transmit nodes of 0.1π is allowed. In a scenario of static transmit nodes, derive the maximum feasible velocity of a moving receive node.