

RadioCom Haut Débit

Table Ronde

*Comment réaliser haut débit et mobilité?
Y a-t-il une place pour les technologies MIMO?*

Dirk T.M. Slock

Institut Eurécom

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Some MIMO Issues: Channel Estimation

1. channel structure modeling and impact on channel estimation error
2. channel temporal variation modeling and equalization options
3. interaction mobile localization and channel modeling/estimation
4. semiblind channel estimation and impact on channel capacity
5. channel reciprocity: Rx \rightarrow Tx

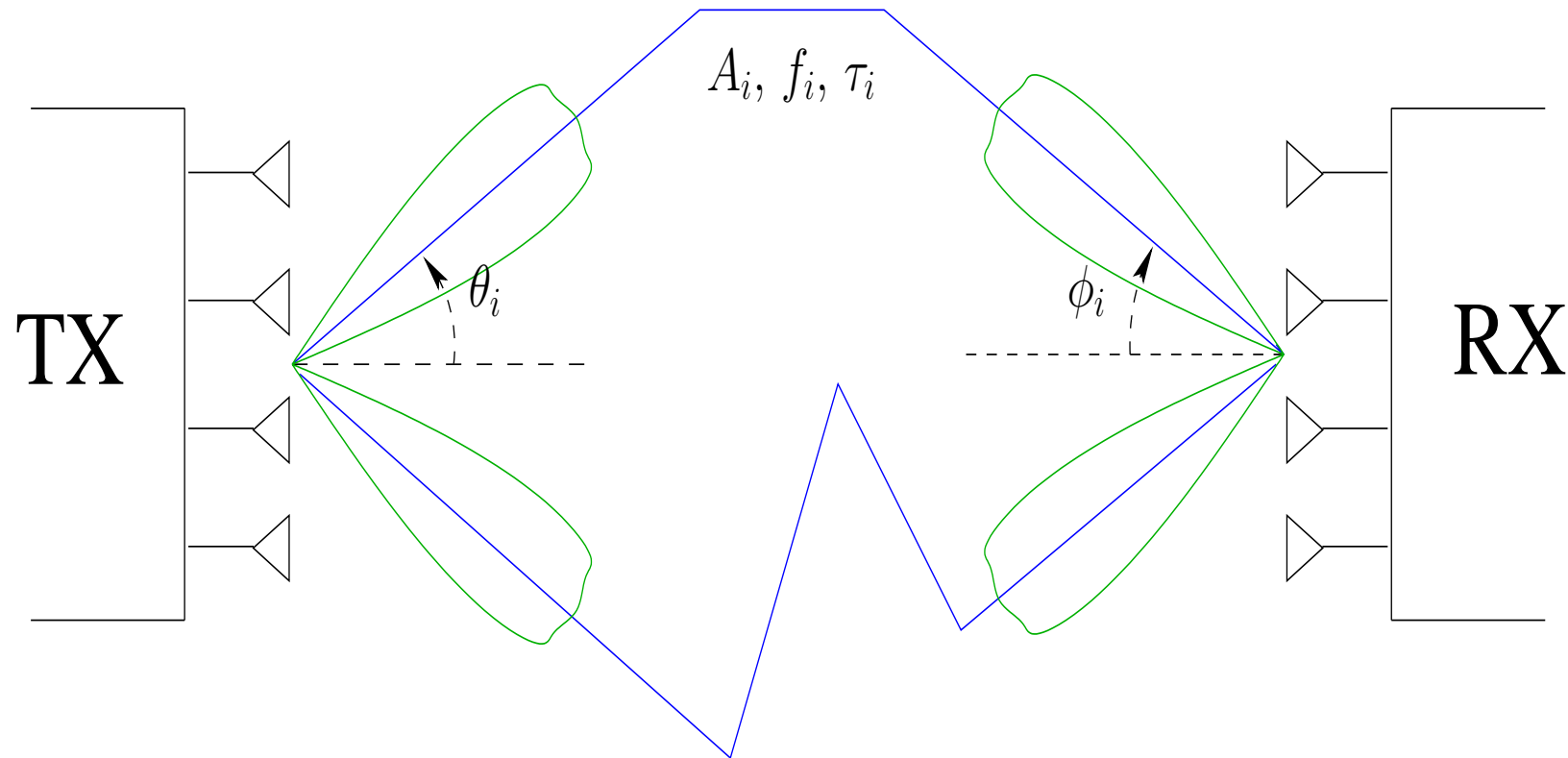


Further MIMO Issues

1. how to use multiple antennas:
MIMO vs. SDMA vs macro-diversity
2. interference detection (cognitive radio) and management:
interstream, intracell, intercell
3. antenna array miniaturization at terminal side, pattern diversity, polarization diversity



MIMO Transmission



- multiple (N_T) transmit and (N_R) receive antennas

Specular Wireless MIMO Channel Model

- time-varying channel: $\mathbf{h}(t, \tau)$

$$\mathbf{h}(t, kT) = \sum_{i=1}^{N_P} A_i(t) e^{j2\pi f_i t} \mathbf{a}_R(\phi_i) \mathbf{a}_T^T(\theta_i) p(kT - \tau_i)$$

\mathbf{h} rank 1 in 3 dimensions; N_P pathwise contributions:

- A_i : complex attenuation
- f_i : Doppler shift
- θ_i : angle of departure
- ϕ_i : angle of arrival
- τ_i : path delay
- $\mathbf{a}(\cdot)$: antenna array response, $p(\cdot)$ pulse shape (TX filter)

