USEEK4 - Antennas and diversity

Mis à jour le 19-02-2026

Code : USEEK4

Unité spécifique de type cours

3 crédits

Responsabilité nationale :
EPN03 - Electroniques, électrotechnique, automatique et mesure (EEAM) / Pascal CHEVALIER

Contact national :

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Présentation

Prérequis

Students should have strong basis in signal processing and telecommunications

Objectifs pédagogiques

The course introduces the concepts of fading induced by propagation multi-paths and the concept of diversity to mitigate the flat fading effects. It focuses on space diversity through SIMO, MISO and MIMO systems. It also introduces the concept of beamforming for free space propagation and the basis of equalization for frequency selective fading channels. Finally it introduces the concept of spatio-temporal coding and spatial multiplexing for MIMO systems.

Compétences

The developed skills concern array processing to mitigate propagation multi-paths effects using both SIMO and MIMO systems.

Programme

Contenu

- Array processing or smart antenna system

- Beamforming for free space propagation

- Fading and diversity for propagation channels with multi-paths

- Space diversity receiver and performance (SIMO systems)

- Equalization for frequency selective channels

- Space time coding for MIMO systems

- Spatial multiplexing for MIMO systems

- Capacity for MIMO systems

Modalités de validation

- Examen final

Description des modalités de validation

Grade higher than 10

Bibliographie

Titre	Auteur(s)
«Fundamentals of wireless Communications », U.K. Cambridge University Press, 2005	D. Tse, P. Viswanath