

Space-Time Techniques for Residential Broadband Wireless Access

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Fixed residential broadband access evolution is being driven primarily by strong demands for increasing bandwidth to support a variety of user services. Competing access technologies include cable, DSL and wireless. Residential wireless service implies cellular type network supporting non-line of sight operation. The 2.5-2.7 GHz (so called MMDS) block is currently proposed for this service in the US.

The key performance differentiation of this network from mobile cellular is the x100 higher data rate and x100 higher quality. Standard cellular (GSM-like or 3G-like) technologies face severe coverage and capacity challenges at these levels of data rates and quality. Use of multiple antennas as the Tx and Rx (MIMO wireless) is a key enabler for such performance.

This talk will survey key MIMO wireless techniques such as diversity, interference cancellation and spatial multiplexing. The nature of the wireless channel in fixed broadband systems and the specific Tx - Rx techniques that exploit such channels will be described.