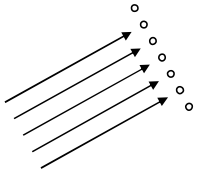
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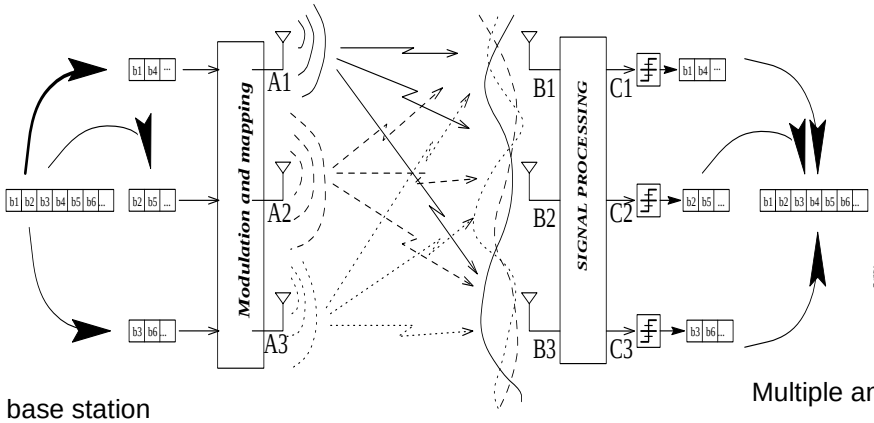
Broadband Wireless

Increased bandwidth with multiple antennas



$$y(t) = \sum_{n=1}^{N} w_n x_n(t) e^{i\vec{x}(\vec{k}-\vec{k}_0)}$$







Smart antenna cellular base station

Multiple antenna laptop

Mobile Internet will offer new opportunities but requires increased bandwidth.

- Smart antennas - capacity is greatly increased using the spatial dimension.
- Multipath is usually a problem in wireless communication, but creates here parallel channels using the same frequency spectrum.
- In the above example a high-rate bit stream is split into three streams transmitted in parallel. The system capacity is increased by a factor of three.