



汤永谦学科建设发展基金世界知名学者 学术报告

ACADEMIC LECTURE

题目: **Underwater Acoustic Communications using Time Reversal (I)**

时间: **2010年5月6日星期四上午9:00**

地点: **玉泉校区微电子楼3楼多媒体教室**

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摘要

Time reversal exploits spatial diversity to achieve spatial and temporal focusing in complex environments and has been applied to underwater acoustic (UWA) communications with a significant delay spread due to multiple path. Temporal focusing (pulse compression) mitigates the inter-symbol interference (ISI) while spatial focusing achieves a high SNR at the intended receiver with a low probability of interception elsewhere. The time reversal approach can be combined with adaptive channel equalization to remove the residual ISI, providing nearly optimal performance in theory. The spatial focusing capability enables an extension of the time reversal approach to multi-user communications. Further, an adaptive time reversal approach has been introduced to minimize the crosstalk among users. This talk will be comprised of two parts. The first part describes challenges in UWA communications, basics of the time reversal mirror and its application to communications. The second part presents recent advances in time reversal communications including basin-scale acoustic communications and synthetic aperture communications exploiting the relative motion between a transmitter and a receiver.