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**Optimization of Transmit/Receive Array Processing for High
Rate Acoustic Communications**

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A broadband acoustic communication link between a user equipped with a single transmit/receive element and a station equipped with an array is considered. System optimization is conducted to obtain transmit/receive filtering techniques that provide best performance over a multipath channel under varying system constraints. Two classes of systems are considered: those that aim for complete intersymbol interference suppression and those that use equalization at the receiver side. Both systems are considered with or without the possibility to implement a perfect channel feedback. Transmit/receive filters are derived analytically, and performance of each scheme is assessed through its data detection SNR. Performance of various techniques is compared analytically, using an example of a shallow water channel, where transmission at high bit rate results in extensive delay spread