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# Capacity estimations for underwater acoustic communication systems with source power constraints

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Channel capacity is an important parameter of underwater acoustic communication (UWAC) systems. For a certain channel and source power, water-filling algorithm of information-theory can be used to estimate the capacity. However, in practice, there are many constraints of the source transmission power. One of the most important constraints is that many communication nodes may exist in a local area, which means that the source power of each node should be confined in order to keep all nodes working normally. Considering this constraint and applying acoustic propagation modeling, this paper estimates the capacities of an UWAC system in some typical propagation conditions. The results are very useful for analyzing the maximum data rate of a practical acoustic channel and providing the optimal parameters of an UWAC system.