

ATELIER « INFORMATION QUANTIQUE : CODES, GÉOMETRIE ET STRUCTURES ALÉATOIRES »  
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WORKSHOP ON QUANTUM INFORMATION: CODES, GEOMETRY AND RANDOM STRUCTURES  
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## Classical coding via decoupling

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Most coding theorems in quantum Shannon theory can be proven using the idea of decoupling : to send data through a channel, one makes sure that the environment gets no information about it ; Uhlmann’s theorem then ensures that the receiver must be able to decode. While a wide range of problems can be solved this way, one of the most basic coding problems remains impervious to a direct application of this method : sending classical information through a quantum channel. We will show that this problem can, in fact, be solved using decoupling ideas, specifically by proving a “dequantizing” theorem ensuring that the environment has only classical information about the data.

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