L1 Adaptative control for small underwater vehicles

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Small underwater vehicles are subject to many disturbances and modelling uncertainties. To overcome these problems, we have introduced a L1 nonlinear adaptive controller for the first time onboard an tethered underwater vehicle. This adaptive controller allows fast convergence of the estimated parameters of the dynamic model even without any a priori knowledge of their values. It is robust to parameters' change, such as salinity or payload changes. It appears that this controller also rejects disturbances (mechanical shock, waves...)
We will detail the theoretical aspects of the said controller and will present the experimental results, obtained with an AC-ROV prototype.