

Regularization with tolerance, applications to dental implant manufacturing

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Abstract: The typical Tikhonov functional uses a discrepancy term which penalizes even minimal deviations from the given noisy data. The noise level as well as technical constraints due favour a tolerance with zero penalization – at least in some specific applications. This leads – even for well behaved operators – to a non-differentiable discrepancy term $\|F(x) - y^\delta\|_{TOL}^p$. We review the existing literature on regularization theory for this case. We investigate the relations to support vector regression approaches and discuss an application to dental implant manufacturing.