

## **$A_1$ theory of weights for rough homogeneous singular integrals and commutators**

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**Abstract.** Quantitative  $A_1 - A_\infty$  estimates for rough homogeneous singular integrals  $T_\Omega$  and commutators of BMO symbols and  $T_\Omega$  are obtained. In particular the following estimates are proved:

$$\|T_\Omega\|_{L^p(w)} \leq c_{n,p} \|\Omega\|_{L^\infty[w]_{A_1}^{\frac{1}{p}} [w]_{A_\infty}^{1+\frac{1}{p'}}} \|f\|_{L^p(w)}$$

and

$$\|[b, T_\Omega]f\|_{L^p(w)} \leq c_{n,p} \|b\|_{\text{BMO}} \|\Omega\|_{L^\infty[w]_{A_1}^{\frac{1}{p}} [w]_{A_\infty}^{2+\frac{1}{p'}}} \|f\|_{L^p(w)},$$

for  $1 < p < \infty$  and  $1/p + 1/p' = 1$ .

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