

# A lower semicontinuity result for a free discontinuity functional with a boundary term

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We study the lower semicontinuity in  $GSBV^p(\Omega; \mathbb{R}^m)$  of a free discontinuity functional  $\mathcal{F}(u)$  that can be written as the sum of a crack term, depending only on the jump set  $S_u$ , and of a boundary term, depending on the trace of  $u$  on  $\partial\Omega$ . We give sufficient conditions on the integrands for the lower semicontinuity of  $\mathcal{F}$ . Moreover, we prove a relaxation result, which shows that, if these conditions are not satisfied, the lower semicontinuous envelope of  $\mathcal{F}$  can be represented by the sum of two integrals on  $S_u$  and  $\partial\Omega$ , respectively.