Abstract. The aim of this work is to prove a L^1-lower semicontinuity theorem for integral functional defined on $BV(\Omega)$.

In particular, here, we obtain a lower semicontinuity result for the functional

$$\mathcal{F}(u) = \int_\Omega f(x,u,\nabla u)dx + \int_\Omega f^\infty(x,\tilde{u},\frac{D^c u}{|D^c(u)|})d|D^c u| + \int_{J_u} [\int_{u^-}^{u^+} f^\infty(x,s,\nu_u)ds]d\mathcal{H}^{N-1}$$

with respect to the L^1-convergence on $BV(\Omega)$. This theorem is stated by only requiring that the integrand f is $W^{1,1}$ in x with a uniform control of the weak gradient and continuous in x (not uniformly with respect to the other variables).

The main tools of the proof of the lower semicontinuity theorem are a new chain rule formula for the function $x \to \int_0^{u(x)} b(x,t)dt$ and an approximation result for convex functions due to De Giorgi.

Moreover we apply this result in order to obtain new relaxation and Γ-convergence result without any coerciveness and any continuity assumption of the integrand $f(x,s,p)$ with respect to the variable s.