**Theorem on sufficient conditions**

Suppose that $\Omega \subseteq \mathbb{R}^n$ and $M \subseteq \Omega$ are closed sets, a function

$$\varphi(\cdot) : \Omega \to [0, \infty]$$

is given, and

$$\Theta = \sup_{z \in \Omega} \varphi(z), \quad D(t) = \{x \in \Omega : \varphi(x) \leq t\}, \quad t \in [0, \Theta),$$

$$F(t) = \{x \in \partial D(t) : \varphi(x) = t\}, \quad B(t) = \{x \in \partial D(t) : \varphi(x) < t\},$$

$$S(t) = \overline{F(t)} \cap \overline{B(t)}, \quad G(t, \varepsilon) = \begin{cases} \emptyset, & S(t) = \emptyset, \\ S(t) + \text{int} B(0, \varepsilon), & S(t) \neq \emptyset, \quad \varepsilon > 0. \end{cases}$$

Suppose also that the function $\varphi(\cdot)$ is lower semicontinuous, $D(0) = M$, $T \subset (0, \Theta)$ is a finite (possibly, empty) set, and the following conditions hold.