On a class of variational inequalities

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We discuss some results on the well posedness of the variational inequality of the following form. Find $u \in K$ such that

$$\langle Au, v-u\rangle + \varphi(u,v) - \varphi(u,u) + j^0(u; v-u)$$
$$\geq \langle f, v-u\rangle \quad \text{for all} \quad v \in K.$$

Here X is a reflexive Banach space, K is a subset of X $A\colon X \to X^*$ is an operator, and $\varphi\colon K \times K \to \mathbb{R}$ and $j\colon X \to \mathbb{R}$ are prescribed functions. The function $\varphi(u,\cdot)$ is assumed to be convex and the function j is locally Lipschitz and, in general, nonconvex. For this reason, the inequality is called a *variational-hemivariational inequality.* Moreover, some applications to contact problems in solid and fluid mechanics are provided.

References

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