

## AN INVITATION TO THE ANTI-PERIODIC PROBLEM

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### 1. INTRODUCTION

Let  $u$  be a vector-valued function defined on  $\mathbb{R}$ . We say  $u$  is  $\tau$ -*anti-periodic* for a fixed  $\tau > 0$  if

$$u(t+\tau) = -u(t), \quad t \in \mathbb{R}.$$

This property seems to have been first studied in [13]. On the other hand, we call  $u$   $\tau$ -*periodic* if  $u(t+\tau) = u(t)$  holds for each  $t \in \mathbb{R}$ . By definition,  $\tau$ -anti-periodic functions are  $2\tau$ -periodic.

In this note, we shall explain results on the anti-periodic problem of nonlinear evolution equations with odd subdifferential operator terms which are defined in real Hilbert spaces. For this, we also relate the definition and properties of subdifferential operator, and some results on the periodic problem.

The author hopes that this note will interest the reader in the anti-periodic problem.

### 2. SUBDIFFERENTIAL OPERATOR (PRELIMINARY)

Let  $H$  be a real Hilbert space with innerproduct  $(\cdot, \cdot)$  and norm  $\| \cdot \|$ . The subdifferential is a (possibly multivalued) operator defined as below: Let  $\varphi: H \rightarrow (-\infty, +\infty]$  be a proper lower semi-continuous (l.s.c.) convex functional. The *effective domain* of