



## **Determination of antenna positioning of a GNSS receiver**

Naiara Bianchi, University of São Paulo, São Carlos, SP, Brazil

Luiz P. S. Damaceno, University of São Paulo, São Carlos, SP, Brazil

Daniel V. Magalhães, University of São Paulo, São Carlos, SP, Brazil

**Abstract.** The quest for time accuracy has always been a necessity and it is no different in modern times. The race for a more accurate time reference is increasingly fierce, for each new stability limit challenge there always seems to be some type of solution, thus the Atomic Clock, the most accurate time marker in the world, was created. One cannot fail to mention that the atomic clock plays a key role in GPS (Global Positioning System) systems in terms of accuracy and time synchronization. GPS is a satellite navigation system that provides accurate positioning information around the world. For GPS to function correctly, it is essential that all receiving devices and satellites are synchronized with respect to time. Therefore, this study aims not only to elucidate the principles and operation underlying the atomic clock, but also to highlight the fascinating ability to accurately determine the antenna position of the clock located at the Space Clock and Time Laboratory (LRTE) facility at the University of São Paulo, São Carlos campus. Our quest to understand the fundamental mechanisms behind the functioning of these sophisticated devices extends beyond theory, diving into the practical scope of geolocation, where the millimeter precision of the LRTE antenna plays a crucial role in several scientific and technological applications. In this context, we will explore not only the theoretical concepts, but also the practical aspects that make the LRTE a prominent instrument in research and innovation in atomic chronometry.