

High Performance Oscillator Evaluation

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At the heart of many critical systems is the master oscillator that in most cases dominates much of the system performance. Without this stable, low noise oscillator the rest of the system would be rendered nearly useless. This is also true for atomic standards such as hydrogen masers, fountains, and even micro-steppers. At the U.S. Naval Observatory six rubidium fountains are being built as part of the clock ensemble that generates UTC(USNO). Each of these fountains also requires a high performance oscillator as part of its frequency chain. This paper looks at several hand picked, low noise, very stable quartz oscillators and shows their behavior versus changes in humidity and temperature. Some custom packaging will also be evaluated to see if it helps to reduce the impact that changes in humidity can have. Access to the local USNO Master Clock allows one to make very good long term measurements in order to evaluate these special oscillators.