



## **CATS, continuous automated testing of seismological, hydroacoustic, and infrasound (SHI) processing software.**

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To detect nuclear explosions, waveform data from over 240 SHI stations world-wide flows into the International Data Centre (IDC) of the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), located in Vienna, Austria. A complex pipeline of software applications processes this data in numerous ways to form event hypotheses. The software codebase comprises over 2 million lines of code, reflects decades of development, and is subject to frequent enhancement and revision. Since processing must run continuously and reliably, software changes are subjected to thorough testing before being put into production.

To overcome the limitations and cost of manual testing, the Continuous Automated Testing System (CATS) has been created. CATS provides an isolated replica of the IDC processing environment, and is able to build and test different versions of the pipeline software directly from code repositories that are placed under strict configuration control. Test jobs are scheduled automatically when code repository commits are made. Regressions are reported.

We present the CATS design choices and test methods. Particular attention is paid to how the system accommodates the individual testing of strongly interacting software components that lack test instrumentation.