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Testing the readiness of strong motion sensors for Earthquake Early Warning

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Today many sensors are marketed as being ready for earthquake early warning (EEW) applications. EEW aims to provide very rapid estimates of event parameters or expected ground motions, spanning wide ranges of source dimension, in advance of the strong shaking. EEW systems based on seismic data can have significant differences in their approach, but in general if a seismic sensor is appropriate for EEW, it should meet a number of key features. It should be capable of resolving the strongest ground motions on-scale, have an appropriate (and linear) dynamic range and broadband frequency response to ensure that small and moderate events can be distinguished from great events, have accurate timing, and crucially be capable to provide reliable low latency data streams. It should also be robust enough to operate for multiple years in the typical vault conditions defined by the local conditions. EEW systems can be significantly improved by enhancing the network density, so there is a balance between sensor quality and cost. We have tested the suitability of 9 different strong motion sensors for EEW, ranging from very high quality though more expensive sensors, to the most reasonably priced sensors currently on the market. Our goal is to identify appropriate sensors for deployment in prototype EEW systems across Central America that are based on EEW algorithms embedded in SeisComP3. Thus, the latency for all sensors is measured via SeedLink streaming protocol. In this presentation we present the performance of the sensors we have tested with focus on parameters critical to EEW in Central America.