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Distributed Fiber Optic Seismic Sensors with Seismic Noise Floor Performance

Fiber Optic Sensors for Seismic monitoring are commonplace in the oil and gas community and are used for understanding seismic profiles in well bores and from one dimensional surface measurements. Recently they have been used in high profile academic work to monitor and measure the effect of earthquakes with the proposal being to exploit existing the infrastructure of telecommunications fiber optics as an early warning systems in the San Andreas fault, California. Current advances in interrogator design bring the performance of such devices down to the seismic noise floor in the sub Hz region with dedicated designs indicating a route to performance significantly below the seismic noise floor. Additionally, over 30,000km of installed monitoring capability now exists of installed vibrational monitoring capability in a wide range of geographic locations with extended baselines that routinely delivers earthquake evidence to asset owners such as pipelines or railroads. We present the concept of using this sensing base as a potential, additional, lower performance but widespread and growing resource of listening sensors.

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