

The observation of active source and ambient noise signals with telecommunication fiber-optic cable in urban area

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The Distributed Acoustic Sensing (DAS) is a rapidly developing technique, which can provide dense (~ meters) seismic observations. Recently, several experiments were performed using specifically deployed fiber-optic cables, while the seismic observation with telecommunication fiber-optic cable in urban area is still challenging. A 5.2 km long telecommunication fiber-optic cable buried at about 30-cm depth in urban area is used to record active source shots and more than 10-hours continuous ambient noise. We are able to extract seismic signals with the telecommunication fiber-optic cable 9 km from the active source (~M10.7). The high-frequency (~ 10 Hz) Rayleigh wave signal emerges from the noise cross-correlation functions. The dispersion information of Rayleigh wave is inverted for Vs at the top 30 m and construct a 2D profile, which helps to assess ground shaking in this area.

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