

Google Undersea Fiber Optic Cable to Detect Quakes

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Google has claimed that it has developed a way to use subsea fiber optic cables to detect earthquakes and tsunamis. While such systems already exist, the company claims its technique **uses existing fiber optic cables and works over tens of thousands of kilometres** as opposed to the up to 100 km limit that current sensing techniques have.

Fiber Optic Cable to Detect Quakes

The company is using the same cables that are instrumental in sharing, searching, sending and receiving information around the world. Fiber optic cables **carry data in the form of light**, which is what makes them incredibly fast and averse to certain challenges copper wires suffer from, like weather.

One of the properties of light that is tracked as part of the optical transmission is the state of polarization (SOP). **The SOP changes in response to mechanical disturbances along the cable** and tracking these disturbances enables detection of seismic activity. The company began monitoring the SOP on its cables in late 2019 and found that it was remarkably stable even after travelling for 10,500km. After a period of no activity, the company **detected an earthquake with 7.7 magnitude off Jamaica**, 1500km away from the closest point of one of its cables. The detection happened approximately five minutes after the earthquake happened, which correlates to the travel time of the seismic wave from Jamaica to the cable. Google has said that it has detected multiple moderate-sized earthquakes, both shorter and longer distances since the Jamaican earthquake. This includes a 6.1 magnitude earthquake on the East Pacific Rise and another 4.5 magnitude earthquake.