

Tsunami tip-off

RECENT natural disasters have made it all too clear that we need cheap and simple ways to prepare for nature's wrath. That's the thinking behind a novel approach to tsunami detection, which would use the submarine cables that supply your broadband.

Existing warning systems use pressure sensors on the seafloor to detect the weight of a tsunami in the water column above. Only five countries own such sensor arrays – the US, Australia, Indonesia, Chile and Thailand – partly due to the high cost of installation. This lack of coverage leaves many countries vulnerable to a tsunami strike.

Now a team led by Manoj Nair at the National Oceanic and Atmospheric Administration in Boulder, Colorado, has proposed a cheaper way to detect an approaching tsunami: use undersea telecommunications cables to detect its electric field. Such fields are created as electrically charged salts in seawater pass through the earth's magnetic field.

Computer modelling by Nair's team shows that the electric field generated by the tsunami that struck south-east Asia in 2004 induced voltages of up to 500 millivolts. Their calculations show this is big enough to be detected by voltmeters placed at the end of the fibre-optic and copper cables that carpet the floor of the Indian Ocean. The work will appear in the journal *Earth, Planets and Space*.

The idea has its limitations, though. Cables would not reveal the exact location or direction of the tsunami, and you would have to subtract noise created by fluctuations in the earth's magnetic field, tides and the cable itself to avoid misleading signals.

Still, "it seems promising", says Bill McGuire of University College London. But he points out that it's just as important to set up a system to quickly pass on warnings to coastal towns after a tsunami has been detected.

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Tekst 3 Tsunami tip-off

- 2p 7 Geef van elk van de volgende systemen aan of dat in tekst 3 wel of niet aan de orde wordt gesteld.
- 1 A network of cables on the seabed that measure increased electricity.
 - 2 A system calculating discrepancies in gravitational pulls and tidal changes.
 - 3 Devices on the seabed that register increased water pressure.
- Noteer het nummer van elk systeem, gevolgd door “wel” of “niet”.

Bronvermelding

Een opsomming van de in dit examen gebruikte bronnen, zoals teksten en afbeeldingen, is te vinden in het bij dit examen behorende correctievoorschrift, dat na afloop van het examen wordt gepubliceerd.