P3.1-511

Observing the oceans and Earth with submarine cables: SMART

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INTRODUCTION AND MAIN RESULTS

SMART Cables embed seismic, pressure, and temperature sensors in telecom cables, providing continuous deep-ocean data at modest cost. Led by the UN JTF, they support climate monitoring, tsunami and earthquake warning, and complement CTBT's IMS. First systems (Tamtam, Atlantic CAM) launch 2027, with global projects planned, offering strong synergies for verification and resilience.

SnT 2025 8 SEPTEMBER ONLINE DAY 9 TO 12 SEPTEMBER AT HOFBURG PALACE, VIENNA & ONLINE
CTBT: SCIENCE AND TECHNOLOGY CONFERENCE

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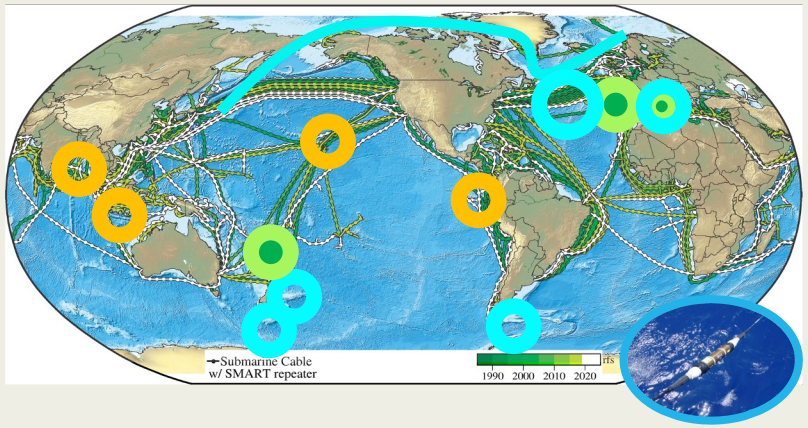
Introduction

Science Monitoring And Reliable Telecommunications (SMART) Cables integrate environmental sensors—temperature, pressure, and seismic motion—into submarine telecommunications cables. By sharing the power and communications infrastructure of millions of kilometers of global fiber, SMART enables seafloor-based observing at modest incremental cost. These sensors support climate and ocean monitoring, while strengthening tsunami and earthquake warning networks. Like the CTBT International Monitoring System, SMART data are inherently multiuse, with strong synergies between the two efforts.

The **Joint Task Force (JTF)**, sponsored by three UN agencies and including governments, academia, and industry, leads the global development of SMART Cables. Today >1.5 million km of undersea cable (≈500 systems) connect the world. As new cables are installed on a 25-year cycle, environmental sensors can be added every ~100 km, gradually achieving near real-time global coverage.

Global and Regional Systems



The InSEA SMART Wet Demo off Sicily has delivered data since 2023. The first full systems—Tamtam (Vanuatu–New Caledonia, 400 km, 4 modules) and Atlantic CAM (Portugal, 3800 km ring Lisbon–Azores–Madeira, ~20 modules)—will enter service in 2027.

Future SMART systems are in planning worldwide, including Trans-Arctic routes (Norway–Japan, 2x), Greenland–Newfoundland–Norway, Europe (Ireland–France–Spain–Portugal; UK–Norway; Azores Inter-Island; Canaries–Spain), Mediterranean (2x), Antarctica (McMurdo, Drake Passage), and India/Andamans.

SMART and CTBT Synergies

The countries involved are developing frameworks for data sharing and joint monitoring. Public-private partnerships between telecom operators, governments, and science institutions are enabling sustainable funding. SMART data streams will enhance climate monitoring, disaster risk reduction, and CTBT verification by providing continuous, deep-ocean seismic, pressure, and acoustic measurements from regions previously under-sampled. Expanding collaboration between SMART and CTBT will strengthen global resilience.