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Spire GNSS-Reflectometry Data Enables Arctic-Wide Sea Ice Mapping

ESA-supported research reinforces the complementary role of commercial satellite data alongside government missions

VIENNA, Va.--(BUSINESS WIRE)-- New research supported by the European Space Agency's (ESA) Third Party Missions programme has generated Arctic-wide sea ice freeboard maps using GNSS-Reflectometry (GNSS-R) data captured by Spire Global, Inc.'s (NYSE: SPIR) ("Spire" or "the Company") GNSS-Reflectometry (GNSS-R) multipurpose listening constellation.

Led by the Technical University of Munich (DGFI-TUM) and the Norwegian Research Centre, the study leveraged Spire's grazing-angle GNSS-Reflectometry (GNSS-R) — a radio frequency (RF) sensing technique that analyzes reflected navigation signals — to retrieve sea ice freeboard measurements across an entire winter season. The results show strong alignment with established altimetry datasets, including ESA's CryoSat mission, validating the complementary role of commercial satellite data alongside government missions.

While GNSS signals have long been used for positioning, this research highlights how reflected signal analysis can extend their value into large-scale Earth observation applications, delivering persistent coverage independent of sunlight or weather conditions.

"Advances in miniaturization, digital signal processing, and machine learning have fundamentally changed what's possible in RF sensing," said Theresa Condor, Chief Executive Officer of Spire Global. "Commercial constellations can now deliver persistent, high-quality RF data that complements traditional government systems with greater flexibility and cost efficiency. As environmental monitoring requirements intensify, we're seeing agencies increasingly integrate commercially sourced RF datasets into operational architectures, reflecting the continued maturation of this market and the growing role of commercial infrastructure in government missions."

Read more on the research from ESA: Reflected satellite signals unlock new insights into Arctic sea ice

About Spire Global, Inc.

Spire (NYSE: SPIR) is a global provider of satellite data, analytics, and intelligence, offering unique datasets and powerful insights about Earth so that organizations can make decisions with confidence in a rapidly changing world. Spire builds, owns, and operates a fully deployed satellite constellation that observes the Earth in real time using radio frequency technology. The data acquired by Spire's satellites provides global weather intelligence, ship and plane movements, and spoofing and jamming detection to better predict how their patterns impact economies, global security, business operations and the environment. Spire

also offers Space as a Service solutions that empower customers to leverage its established infrastructure to put their business in space. Spire has offices across the U.S., Canada, UK, Luxembourg and Germany. To learn more, visit spire.com.

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