



#BACKGROUND:
Permafrost regions contain numerous natural gas deposits. Pipelines transport gas from extraction sites to end users. The pipeline supports (columns/piles) are subject to displacement due to permafrost thawing, thermokarst processes, and frost heave, which can lead to pipeline deformations and damage.

Currently, pipeline integrity inspections are primarily conducted manually, requiring significant time and labor resources. Moreover, this approach does not always ensure timely defect detection.

SSTEM PURPOSE:
Monitoring pipeline deformations using fiber Bragg grating (FBG) sensors.