

## Pipeline Wave Propagation and Dynamics

Pipelines represent a significant proportion of the world's infrastructure, transporting water and fuel large distances across all parts of the planet. But pipes can be found in almost every area of modern living: in our homes and cars, in factories and process plants, and in sea-going vessels, to name but a few. Often situated in places with difficult access (on the ocean floor, in remote deserts or deep beneath our bustling cities, for the case of infrastructure pipelines) acoustics and vibration methods have been the go-to approaches for assessment and monitoring. On the face of it simple one-dimensional structures, there is a wealth of information which can be potentially gleaned about a pipeline once its dynamic behaviour, including the interactions with its environment are properly understood. Such information might include its position and orientation (frequently not known accurately for buried pipes), its condition (including the location and scale of leaks), and its response to environmental change (whether natural or human-induced), to name but a few. In particular, research around leak detection is an exciting and rapidly growing field, as we struggle to preserve and distribute resources around the planet effectively and efficiently.

The current session aims to bring together researchers to exchange recent developments in pipeline wave propagation and dynamics, including, but not limited to, the science underpinning acoustic/vibrational leak detection methods, pipeline condition monitoring, one-dimensional wave propagation, sensing and signal processing. Discussions of the state-of-art and future areas of research are welcome.

Key words: pipelines; wave propagation; dynamics; leak detection; condition assessment

Jen Muggleton, University of Southampton, UK  
Fabricio de Almeida, UNESP, Brazil