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**Modelling of surface acoustic waves and e.m. fields in opto-mechanical systems**

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The present c ontribution present modelling and simulation of phenomena of optical-phononic circuits, where

coherent phonons are the state variable. The concept is based on cavity optomechanics (OM) to develop GHz- frequency in-chip phononic circuits for room temperature operation. Such circuits will integrate OM-pumped phonon sources and detectors as well as phonon processing components (waveguides, splitters, memories, photonic RF signal processing) to process information with phonons outside the cavity. The above vision relies on the generation of GHz to tens of GHz coherent phonons, on the their coupling efficiently into a waveguide, on engineering their propagation with low losses, and on detecting them at room temperature. Phonon-based processing will enable on-chip synchronisation and transfer of information carried between optical channels by phonons, which could eventually serve as a future scalable platform for, e.g., practical information processing with phonons. The technical work is organised in three work-packages.