Contribution ID: **137** Type: **Poster**

Multiplexed readout of kinetic inductance bolometer arrays

Thursday, July 25, 2019 6:45 PM (15 minutes)

Kinetic inductance bolometer represents a sensor technology that can be scaled into large 2D detector arrays. Such detector arrays are attractive for passive sub-millimeter and terahertz imaging systems, providing mechanical simplicity and good-enough imaging capability for terrestrial imaging. We have previously reported on the successful implementation of an imaging system containing a focal plane array equipped with thousands of pixels, optics system and cryogenics operating above 5 K. Here we present a new multiplexing scheme capable of reading the whole detector array with only a modest noise penalty. The readout is called serial addressed frequency excitation (SAFE) as it combines features from both time-domain and frequency-domain multiplexing (FDM) schemes. As a result, the readout is substantially simplified compared to the full FDM case where expensive high-speed digital electronics would be needed. After introducing the readout concept, we describe our implementation of it and show experimental results that verify its performance. Furthermore, video imagery of human subjects at a stand-off of a few meters is presented.

Less than 5 years of experience since completion of Ph.D

Y

Student (Ph.D., M.Sc. or B.Sc.)

N

Primary authors: Dr LUOMAHAARA, Juho (VTT Technical Research Centre of Finland, QTF Centre of Excellence); Mr SIPOLA, Hannu (VTT Technical Research Centre of Finland, QTF Centre of Excellence); Dr TIMOFEEV, Andrey (VTT Technical Research Centre of Finland, QTF Centre of Excellence); Mr GRÖNBERG, Leif (VTT Technical Research Centre of Finland, QTF Centre of Excellence); Mr RAUTIAINEN, Anssi (Asqella Oy); Dr LUUKANEN, Arttu (Asqella Oy); Dr SAENZ, Elena (ESA European Space Agency, ESTEC); Dr HASSEL, Juha (VTT Technical Research Centre of Finland, QTF Centre of Excellence)

Presenter: Dr LUOMAHAARA, Juho (VTT Technical Research Centre of Finland, QTF Centre of Excellence)

Session Classification: Poster session

Track Classification: Detector readout, signal processing, and related technologies