Contribution ID: **50** Type: **Oral presentation**

Linear photon-counting with HgCdTe APDs

Thursday, June 14, 2012 4:10 PM (20 minutes)

HgCdTe APDs have been shown to exhibit single carrier multiplication (SCM) which gives desirable properties such as low multiplication excess noise (F<1.2) and gain independent response time up to multiplication gains exceeding 1000. Combined with quantum efficiencies (QE) which can approach 100 % in optimized detectors, theses detectors have the highest information conservation ratio QE/F of all amplified detectors, from ultra-violet wavelengths up to the infra-red cut-off of the APDs. Theses properties open new perspectives for photon-counting applications in a linear mode that enables proportional photon-counting, high photon detection efficiency (PDE), low after-pulsing, high count rates and low dark count rates (DCR).

In this communication we present the status of HgCdTe APD technology at CEA/Leti and show first results on photon-counting circuits made of HgCdTe APDs hybridized with specially designed read-out integrated circuits (ROICs). The ROICs are made using compact CMOS electronics to enable integration into large area-small pixel focal plane arrays. The results will be discussed in terms of the impact of the HgCdTe APD gain and response time characteristics on the most common photon-counting figure of merits and which perspectives that can be expected from improved APD and ROIC design.

Primary author: Mr VOJETTA, Gautier (CEA/Leti)

Co-authors: Mr GUELLEC, Fabrice (CEA/Leti); Dr ROTHMAN, Johan (CEA/Leti); Dr FEUTRIER, Philippe (IPAG)

Presenter: Mr VOJETTA, Gautier (CEA/Leti)

Session Classification: New devices