



**PRESS RELEASE**

## **CEA-Leti Creates an HgCdTe Infrared Imaging Array With Record-Breaking Thermal Resolution**

*Designed for Defense and Security Applications, Array Achieves Sensitivity  
Close to One-Thousandth of a Degree Kelvin*

GRENOBLE, France -- Nov. 29, 2010 -- CEA-Leti announced today the first infrared imaging array in the 8-10 $\mu$ m band capable of returning an image with a record-breaking minimum temperature difference, or thermal resolution, of 1 to 2mK at ambient temperature and with traditional image cadences of 25-50 Hertz.

Leti also created an infrared detection array by linking an innovative reading circuit, manufactured using CMOS-silicon technology, to an array of HgCdTe infrared detectors.

Designed for defense and security applications, the HgCdTe array has a format of 320x256 and a pitch of 25 $\mu$ m. The array achieved ultimate sensitivity of close to one-thousandth of a degree Kelvin at an operating temperature of 77K. It represents 10-20x increase in sensitivity compared with what is normally possible under the same observation conditions with conventional components.

To obtain this extremely high sensitivity, CEA-Leti designed and produced a special silicon reading circuit with a 0.18 $\mu$ m CMOS die, involving an analog-to-digital conversion at each elementary detection point with a pitch of 25 $\mu$ m.

The analogue-to-digital conversion is based on the counting of charge packets given off by the detector. An equivalent stored charge of 3 giga-electrons can be obtained. This reading circuit, which is noise-optimised, thus makes it possible to achieve a level of sensitivity never before obtained on a component of this class.

CEA-Leti presented these results at the international *Defense, Security and Sensing* conference Orlando, Fla., US, and as part of an invited paper at the international SPIE *Defense and Security* conference in Toulouse, France, this year.

These results are the fruit of research carried out in a joint Sofradir-CEA (DEFIR) laboratory, with support from CEA, Sofradir, DGA and Onera. Sofradir is producing the HgCdTe infrared detector technology developed by CEA-Leti under exclusive license from CEA.

### **About CEA-Leti**

CEA is a French research and technology public organisation, with activities in four main areas: energy, information technologies, healthcare technologies and defence and security. Within CEA, the Laboratory for Electronics & Information Technology (CEA-Leti) works with companies in order to increase their competitiveness through technological innovation and transfers. CEA-Leti is focused on micro and nanotechnologies and their applications, from wireless devices and systems, to biology and healthcare or photonics. Nanoelectronics and microsystems (MEMS) are at the core of its activities. As a major player in MINATEC campus, CEA-Leti operates 8,000-m<sup>2</sup> state-of-the-art clean rooms, on 24/7 mode, on 200mm and 300mm wafer standards. With 1,200 employees, CEA-Leti trains more than 150 Ph.D. students and hosts 200 assignees from partner companies. Strongly committed to the creation of value for the industry, CEA-Leti puts a strong

emphasis on intellectual property and owns more than 1,500 patent families.  
For more information, visit [www.leti.fr](http://www.leti.fr).

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