

Ultimate Low Light-Level Sensor Development



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SENSE – Background



• SENSE is a European Commission Horizon 2020 Coordination and Support Action (FET-OPEN)

aiming to coordinate research and development efforts in academia and industry in low light level

sensoring

• Started in September 2016 for three years



successful midterm review with EC in November 2017

• Experience from ASPERA and APPEC technology fora:

> coordination of European research groups concerned with low light-level sensors is currently missing

> representatives from academia and industry pointed out that developments could be made faster when one or a small

number of labs could take the lead of these activities





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SENSE – Expert Group

• the Experts Group (EG) comprises first-rate developers in the field of low light-level sensors,

representatives of major research projects requiring low light-level sensors

- they act as an advisory panel to the project:
 - Razmik Mirzoyan, MPI for Physics, Germany, (head of experts group)
 - Sergey Vinogradov, Lebedev Physical Institute, Russia
 - Elena Popova, MEPHI, Russia
 - Klaus Attenkoffer, Brookhaven National Lab, US
 - Bayarto Lubsandorzhiev, INR of the Russian Academy of Sciences, Russia
 - Samo Korpar, Jožef Stefan Institute, Slowenia
 - Peter Krizan, Jožef Stefan Institute, Slowenia
 - Osvaldo Catalano, INAF, Italy
 - Claudio Piemonte, Broadcom, Germany
 - John Smedley, Brookhaven National Lab, US
 - Stefan Schönert, Technische Unversität München, Germany
 - Eric Delagnes, CEA, France
 - Nicoleta Dinu-Jaeger, CNRS Artemis, France
 - Giovanni Bonanno, INAF, Italy
 - David Gascon, ICCUB, Spain
 - Wei Shen, University of Heidelberg, Germany
 - Hiro Tajima, University of Nagoya, Japan





SENSE – WP 1

- aim: roadmap incorporating all R&D activities necessary for the development of (the) ultimate LLL sensor(s)
- steps afterwards: monitor and evaluate the progress, coordination of the efforts
- first version of roadmap is available since October on website and in follow up process



https://www.sense-pro.org/documents/roadmap







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www.sense-pro.org



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SENSE – WP 2: Tasks



2.1 Agreement on R&D cooperation between research groups and industry for advancing LLL sensors

- Minimizing the duplication of efforts given the limited funds for innovation;
- Encouraging the formation of **Consortia** between research Institutions and Industrial partners ;
- Negotiation between research institutes and industries to optimize costs of developments capable of satisfying 'common needs';
- Offering a platform for testing devices;
- Offering a **platform for disseminating knowledge on developments**;
- Develop a sensors database with "quality factor".

2.2Linking to other European initiatives

 Provide information on the R&D activities followed by SENSE through the web page (WB3), phone calls of the working group and with EG;

2.3Fostering the exchange between academia and industry

Organization of Technology Forum: <u>https://indico.cern.ch/event/688729/overview</u>













SENSE – WP 2: PDE vs. Wavelength







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SENSE – WP 2: P_{XT} vs. ΔV



SENSE – WP 2



By now:

- The experimental setup was build & calibrated: DCR(ΔV , VThr.), PXT(ΔV), PDE(ΔV , λ);
- Cooperation agreement between 5 institutes was established:
- DESY; UNIGE; KIT; Nagoya University ISEE, MPI for Physics, INAF OAC
- MPPC devices were distributed between institutes
- Receiving newest devices from producers (Hamamatsu, SensL, AdvansID, Ketek, Ndl Sipm)

Future:

- Evaluate systematic errors for each experimental setup;
- Establish measurements and analysis procedures;
- Applying for European money to develop a SiPM for medical application



SENSE – WP 2 TechForum 21/22nd of June

https://indico.cern.ch/event/688729/overview

- About 90 participants by now
- 2 days programme









SENSE – WP 3 and WP 4



- WP3: Website (https://www.sense-pro.org) and newsletter online/ active
- SENSE @ several upcoming workshops/ conferences: ICASiPM, RICH 2018, Barcelona Techno Week,

E+CRS, ..., several other workshops already done, first two SENSE publications

- Calendar with LLLrelated events and workshops online
- WP4: technology training sessions during summer schools in summer 2018 (MAGIC, TESHEP) and

Training event in summer 2019

- → Material (videos of training sessions) will be prepared for website
- Consortium partners with experts: several H2020-proposals (FET-OPEN, FET CSA, FET Launchpad)



SENSE – come and join!

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Request Form

To register as a new SENSE member, please fill in your details below. An administrator will review your application.

All fields marked with an asterisk are mandatory.

Name *			
Institute *			
Position at Institute			
Email *			
Submit			









Thank you for your attention!

Please visit *sense-pro.org* for the latest news and the SENSE Forum for latest discussions and stay in contact with us

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