Reviewer B:
In their paper entitled ?Detection of THz nanosecond pulses by fast Hot
Electron Bolometer?, N. Palka et al. present first experimental results of
THz pulses detection by mean of a fast detector based on HEB technology. The
results are obtained by mean of an experimental set-up that is based on a
two commercial components: the THz optoelectronic source and the fast HEB
detector. These emitter and detector are assembled with some optics
(mirrors, polarizer, analyzer...) to form a set-up that will be devoted to
spectroscopy. First characterizations of both the emitter and detector are
presented and the conditions of use of these elements are presented.
Finally, the authors present measurement of a fast (20 ns) electrical pulse
emitted in the THz range and the linearity of the HEB detector apparatus is
checked.
It is worth noticing that this type of THz instruments dedicated to
broadband characterization in the 0.5 ? 2.5 THz range is not commonly used
in THz laboratories where optoelectronics solutions based on the use of a
femtosecond laser are more commonly used. So, it is my opinion that this
approach using a THz OPO and a very sensitive detector can be of special
interest while characterizing strongly absorbing material.
Therefore, under the scope of THz scientific instruments based on
optoelectronics solutions, the paper is well into the topics of the journal.
In my opinion, the it could be selected for publication in Photonics Letters
of Poland, whereas, its quality would be improved if some points were
addressed in more details (specially points 1 and 7).
1. First, in their introduction, the authors should mention the application
(spectroscopy, imaging ?) they intend to do with their set-up. From this
they should emphasize their needs for the set-up performances (tunability,
level of power, dynamics, and bandwidth required?).

A paragraph in summary was added.
2. The author should mention and discuss the possibility for spectroscopy
measurements by using cw THz set up based on tuneable diode lasers.

A paragraph in introduction was added.
3. Considering the overall properties of their apparatus, it appears that,
as compared to other systems such as TDS system, the presented set-up offers
the possibility to measure THz nanosecond pulses in a real time manner. May
be the author should discuss and enlightened this point and give some
example of possible applications of this feature.

A paragraph in summary was added.
4. The description of the laser system (THz OPO) is too long as the system
is a commercial one. The authors will gain in place while reducing this
first part and propose to the reader an appropriate reference such as this
one (Sato et al. Tabletop terahertz-wave parametric generator using a
compact, diode-pumped Nd:YAG laser, Review of Scientific Instruments,
Volume: 72 , Issue: 9, Publication Year: 2001 , Page(s): 3501 ? 3504).

The OPO description was shortened. The reference was added.
5. Concerning the system characterization, it is not clear if Fig. 2 has
been obtained by the OPO and the presented HEB detector or with another
detector.

The sentence “Tuning curve of the OPO (Fig. 2) was measured by means of the Golay cell in a setup described in [3].” was added.
6. About the detection system, the basic physics of the HEB apparatus is
given, but it is said that considering Ref (5) the selected area (Fig. 5) is
the optimal one for noise? may be it should be worth noticing if it is the
best region of bias also for sensitivity.

The sentence “For chosen voltage detector has also the best sensitivity.” was added.

7. In the last picture, the authors are checking the linearity of the
detector, but no information is given about the noise level of the overall
set-up. (together with stability). Moreover, this noise level will also give
the possible dynamics of the system (minimum detected level/ maximum
detected level), taking into account the low saturation power of the
detector (0.1 ?W). This dynamic is important at it can be compared to the
dynamic of classical TDS systems whose dynamics is usually better than 60 dB
(THz electrical field).

A paragraph before last picture was added: “For the incoming radiation weaker than 0.8nW the signal-to-noise ratio became lower than one. It means that the dynamics of our system was only a little better than 20dB. To improve this parameter of our system we used a set of attenuators with precisely measured attenuation. It allows us to enhance dynamics to almost 50dB.”