# Consensus Result: Photoacoustic Data and Device Parameters

Consensus vote start: 6th of January 2020
Consensus vote end: 20th of January 2020

**Consensus Vote result:**

Number of votes: **40**

Agreement: 30 (**75%**)
Reservation: 8 (20%)
Standing Aside: 1 (2.5%)
Rejection: 1 (**2.5%**)


**Vote outcome:**

With >70% agreement and <10% rejection, the document will be published on the IPASC.science website and will remain labelled “for consultation and feedback” at least until the 20th of January 2021.

**Feedback comments during the vote:**

It is quite comprehensive.

The term photoacoustic should be replaced with optoacoustic/photoacousticith

Thanks for making this happen

In the Definitions, it is written as "Frame: A set of raw timeseries data corresponding to a specific time point and wavelength." It can be suggested as "Frame: A set of raw time series data corresponding to a specific time point." (Wavelength is preferred to be an experimental parameter);  In the "Attributes", it is written as "Any additional information should be reported in the metadata if by any means feasible". It can be written as "Any additional information should be reported in the metadata by any feasible means (if possible)."  In Part 1 - Photoacoustic Imaging Device, it is written as "All coordinate positions ofthe individual elements will be given in cartesian coordinates relative to theorigin of the transducer." The origin of the transducer is not defined in the document. It seems the origin of the frame of reference is defined at one of the edges of the transducer but not specifically defined. In Part 1 - Photoacoustic Imaging Device, some additional parameters may be added such as "Tunability of wavelength" in "Illuminator Properties"; “CentralFrequency” in “Detection Properties”; “Spacing Between Elements” in “DetectionElement”;  “Dimension of Elements” in“Detection Element”; "Amplification factor" in “Amplification Properties”;  In Illumination element, more particularly in Illumination orientation, it is written as "Description: The illuminator orientation defines the rotation of the illuminator in3D cartesian coordinates [r1, r2, r3] . It isthe normal of the planar illuminator surface." Are r1, r2, r3 position vectors not coordinates which are earlier defined by x1, x2, x3.

In the coordinate system by which the positions of individual elements are given, how is the origin of the transducer defined in absolute terms? It seems that the field of view should be volume, not area. In wavelength range, there is confusion between the terms accuracy and precision. For the meaning intended, remove the word accuracy and use only the word precision. Alternatively, add an additional value to make four values, to include both accuracy and precision. Clarify whether time gain compensation, element-dependent gain, overall gain and frequency dependent filter are applied to the analogue signal before digitisation. Missing: In illuniator, the maximum intensity of the element in absolute units. In detector, the sensitivity in noise-equivalent acoustic pressure amplitude at the peak frequency and angular response.

It seems fine to me, I think it would be good to add in detector dynamic range (in either dB or bit) into the optional data.

Looks great.

Add 'illumination bandwidth (nm)' to 'Illumination Element Properties', 'Impulse Response' to 'Detection Element Properties, 'Amplification/Amplifier (dB)' to 'Detection Element Properties'

Very comprehensive and accurate! Pls check if we need to specificy detection-element shape: circular, square, rectangular, or even singe-ring (annular), multi-ring .

n/a

A number of the parameters need tidying up in a minor way in terms of their definitions but the document is a good starting point.

"dtype" inconsistencies (e.g. dtype is double array while text describes the type as functional in "Laser Energy Profile"); Frame acquisition timestamps should be split into a single reference timestamp in unix time (in integer seconds, e.g. at first data acquisition) and a time array with the elapsed times since the reference. Otherwise numerical precision will be limited to about 100ns due to floating point representation in computer memory. Matlab demonstration: timeStamp = etime(clock, [1970, 1, 1, 0, 0, 0]); timeStamp == (timeStamp + 100e-9) % returns true!

**List of voters:**

Sarah Bohndiek, Ruiqing Ni, Lina Hacker, Stefan Morscher, Moritz Wildgruber, François Varray, Ben Cox, Janek Gröhl, Haoye Qin, Wenfeng Xia, Harish Poptani, Mantvydas Jasinskas, Georg Watzl, Alexander Oraevsky, Junjie Yao, M Suheshkumar Singh, Maura Dantuma, Berkan Lafci, Lawrence Yip, Jeff Bamber, Jason Raymond, Mithun Kuniyil Ajith Singh, James Joseph, Luca Menichetti, James McLaughlan, Jan Klohs, Dario Longo, Martina Capozza, Mohammad Mehrmohammadi, Markus Seeger, Nina Reistad, Srirang Manohar, Kris Dreher, Sergey Ermilov, Efthymios Maneas, Weylan Thompson, Muyinatu Bell, Peter Brecht, Bajram Zeqiri, Elena Petrova