First of all, the authors would like to thank the reviewer for his valuable comments. The authors have adapted the manuscript according to the suggestions. In what follows, extra clarification is given in response to the comments.

**Reviewer B**

*The paper presents a light coupler for an application in microfluidics as a part of absorbance detection. In my opinion the paper cannot be published in the present form. The main drawbacks are as follows:*

1. *The authors used solutions of a fluorescence compound for the tests of the system with absorbance detection. So as a matter of fact, they have measured two signals: one originated by absorbance and the second generated by fluorescence, although a special filter was used.*

The final goal of the proposed system is to combine both absorbance and fluorescence on the same chip, however we decided to first demonstrate the proof-of-concept for absorbance detection and in a next step we will add the functionality for fluorescence detection. In both detection paths we make use of an appropriate filter to filter way the undesired light. The simultaneous measurement of absorbance and fluorescence in the same chip can be important for several applications like the degradation of lubricant oils. In [1] we successfully demonstrated that fluorescent test samples can be used to measure both absorbance and fluorescence when the correct band pass filters are used. Therefore we decided to immediately use standard dyes which also could be used in the final system to determine the sensitivity of the system for both absorbance and fluorescence.

[1] S. Van Overmeire, H. Ottevaere, A. G. Mignani, L. Ciaccheri, G. Desmet, H. Thienpont, “Tolerance analysis of a micro-optical detection system for on-line monitoring of lubricant oils”, J. Micromech., Microeng., Vol. 20, No. 10, No. 105018, 2010

The following has been added to the revised manuscript

*The system was also designed in such a way that fluorescence detection could be added as additional functionality to the microfluidic chip.*

*2. More details on technology utilised for the preparation of the chip are needed:*

*a. The authors stated that the chip was bonded and then the wholes were*

*drilled. After bonding? What about debris, which occurred during drilling?*

The holes with a diameter of 500µm, drilled through the bottom of the silicon chip, were made in the silicon chip before anodic bonding of the glass plate to the silicon chip. A very accurate milling machine was used to drill the holes at a very low speed such that a minimum amount of debris was created. The latter were removed by a standard chemical cleaning process for silicon and did not create any problems for the in- and outlet of the fluid into the channel.

*The text in the paper has been adapted accordingly.*

*b. A microfluidic channel has a width of 1.5 mm, a height of 50 um. There is*

*no data on a length. These dimensions are necessary to evaluate the total volume of the detector.*

The microfluidic channel has a channel length of 50 mm, a width of 1.5mm and a height of only 50µm. These cross-section dimensions were chosen arbitrarily to construct this first proof-of-concept prototype, but can be changed to suit other applications. Also more complex microfluidic circuits or z-cells with oblique sidewalls could be used. However important to mention is that not the whole channel is illuminated at once, only in a small part of the channel interaction between light and test sample occurs. Indeed, the light is confined in the channel over a width of 1.5 mm, a length of 200 µm and a height of 50 µm which opens up opportunities for parallel measurements.

*The remark has been incorporated in the revised manuscript.*

*3. It is not clear how the authors obtained the values in table 1. How the*

*peak area was calculated?*

To verify the concentration measurement range and the detection limit experimentally, the response of the system on a set of five standard coumarin solutions with concentrations between 0.6 µM and 6mM are characterized. For every standard solution six consecutive injections are measured and the average peak area (in AU\*s) is calculated for each concentration. Peak area is a common term in microfluidics and is related to the concentration and the quantity of the material tested.

For peak area measurements the area below the peak curve needs to be integrated. To determine the peak boundaries the first derivative of the signal, representing the slope or the tangent in each point of the signal, is calculated. When the slope exceeds a predefined slope threshold, a peak start is detected. Between the start and the top of the peak, the slope is positive, at the top it is zero and after the top until the peak end it is negative. The peak stop is detected where the slope becomes larger than a predefined negative slope threshold. In this work the peak area between the peak start and stop is calculated by trapezoidal numerical integration. Instead of using numerical integration to calculate the peak area, a frequently used approach in analytical chemistry is to apply a least squares fit on the data points. In particular for chromatographic and electrophoretic separations many models are described in the literature which can be used to fit data from samples emerging from the separation column. Several properties such as peak height, area and asymmetry can be derived from the mathematical representation of the model applied to the data.

*Due to the limitation on the number of pages a reference has been added in the revised manuscript.*

*Analysing figure 3 two facts are obvious: the base line is not stable and the recorded peaks have different heights. From metrological point of view, this is very serious drawback of the microsystem.*

The remarked drawbacks are reduced in a post-processing step. After the time-domain filtering step (moving average filter), the linear background drift caused by the source, detector and possible solvent variations is fitted with a 1st order curve and removed from the measured signal. This procedure is called trend-removal. Finally the signal is differentiated for peak identification. At the peak locations the filtered non-differentiated detector signal is further processed to quantify the heights and the areas of the measured sample peaks resulting in small standard deviations as shown in Table 1.