Use of Virtual Reality for Reading a Superheated Emulsion Detector

J. C. S. Sobrinho1, A. C. E. Santo1, C. M. N. A. Pereira1, A. C. A. Móll1

e-mail: volksparati@hotmail.com, cotelli.andre@gmail.com, cmnap@ien.gov.br, mol@ien.gov.br

1 Instituto de Engenharia Nuclear (IEN / CNEN)

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The key point in the use of the detector is the bubble counting after the detector interacts with a neutron field. The number of droplets provides a direct measure of the neutron dose equivalent to a tissue [1]. The company Bubble Technology Industries offer a gear score to bubble detector buyers: the BDR-III. The auto bubbles reader BDR-IIITM is the solution to a large number of detectors. The BDR-III provides barcode reading and counting through fully automatic machine vision which provides data files which are compatible with a compact and simple to use instrument [2]. To allow the user to verify the correct operation of the BDR-III, a calibration detector is provided together with each reader. This calibration detector has a fixed number of bubbles and is of the same size as a BD-PNDTM (Personal Neutron Dosimeter Bubble Detector). The number of bubbles is provided in the system documentation. The reader BRD-III is acting together with the specification that the count of bubbles is observed ± 10% of the count of the manufacturer [2]; it means that has a bypass counting. Additional calibration detectors can be purchased separately for the BDR-III reader, however, it is worth remembering again that the manufacturer recommends that the detectors calibration is changed periodically for optimum performance in terms of verification of the BDR-III system. Thus the creation of an alternative method which can do the counting of bubbles and, therefore, reduce the maintenance cost with the cyclic purchase of calibration detectors represents an interesting alternative. Thus, the present work deals with the creation of a computer interface that has the ability to provide its user viewing the detector, and that can interact with this manipulating its spatial position (with the application of steps capable of rotating the detector on the vertical axis) or by checking the bubbles through a mode of interaction space viewed within the detector and finally providing the number of bubbles counted, or marked.

With the use of stereo vision technology (3-D) visualization of the detector as well as the visualization of spatial interaction from the user, it presents a more realistic view of this type of simulation provide a different look from what can only be observed on the flat screen monitor of a computer with normal vision.

Figure 1 shows the interface with the auxiliary display. The work described in this report is the result of a MSc. Dissertation [3] and was published by the authors at the International Nuclear Atlantic Conference - INAC 2013[4].

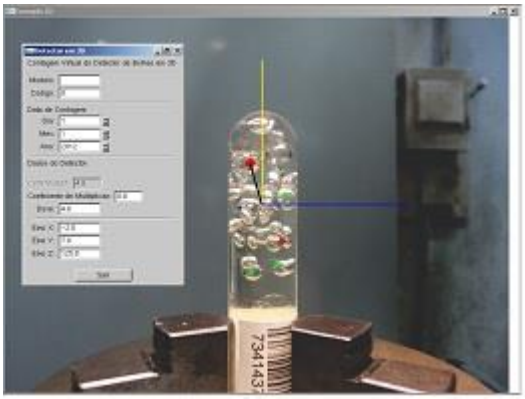

Figure 1: Interface with its main screen and auxiliary screen.

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