

**3rd INTERNATIONAL CONFERENCE ON COMPUTATIONAL
AND EXPERIMENTAL SCIENCE AND ENGINEERING
(ICCESEN-2016)**

19-24 October 2016, ANTALYA-TURKEY

**Laser Driven Beam Therapy – Where are we now?
An Update to the Bodrum Presentation of 2014**

Ken LEDINGHAM^{1,2} and Hamdi Şükür KILIÇ²

¹*Dept of Physics, University of Strathclyde, Glasgow G40NG, Scotland*

²*University of Selcuk, Faculty of Science, Department of Physics, Konya,42031,Turkey*

Abstracts

In his presentation, Prof. Kilic gave a detailed account of how high power lasers could produce beams of charged particles especially electrons, protons and heavy ions. I shall not go over this again but the only thing I need you to remember is that if a high powered laser beam hits a neutral target of any element or compound, intense beams of charged particles are produced. I shall concentrate on how laser driven beams of protons and electrons can be used for cancer therapy and how potentially this is superior to the commonly used x-ray therapy.

However to put this in context, I shall describe why conventional accelerator based proton and heavy ion therapy is such an important therapy for the treatment of tumours in sensitive places in the body particularly in the brain and especially for children. To this end the treatment in Prague given to the child Ashya King from Southampton in England will be described. It will be pointed out that the treatment is very expensive and hence cannot be used universally in the treatment of cancer.

Potentially laser driven particle beams are very much cheaper and this gives lasers a distinct advantage over conventional accelerators. What progress has been made since 2014 for laser driven proton therapy?

I shall also describe in detail the potential of laser driven very high energy electron beam therapy (VHEE) which has been shown to possess a dose conformation (much more accurate tumour concentration) and hence tissue sparing capability exceeding those of photon therapy, the most commonly used beam therapy in tumour irradiation.

Keywords: *beam, therapy, laser, proton*

✉ **Corresponding Author Email** : ken.ledingham@strath.ac.uk