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High peak power lasers and their medical applications

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The field of high peak power lasers have seen considerable developments over the past years. Several lasers delivering more than 1 PetaWatt peak power at significant pulse rates have become available and there are several 10 PW lasers in construction worldwide.
In addition to the improvement of performance (higher peak power, shorter pulse duration, higher repetition rate), there are also tremendous evolutions in the ease of use of such lasers which are more compact and more reliable.
In parallel significant research results have confirmed the emergence of new acceleration schemes for electrons, protons and ions such as laser wakefield acceleration and target normal sheath acceleration which may in turn generate medical applications like protontherapy.
High intensity lasers allow also the generation of X-rays which can be used for example in medical imagery.
We present the recent evolutions of laser technology which will generate in the near future new medical applications of high peak power lasers.

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