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# First commercial Double OscillatorNd:YAG Laser for PIV

## Introduction

Back in 1984 teams of the University of Oldenburg (Prof. Klaus Hinsch) and DLR performed the first PIV tests in a wind tunnel at DLR in Göttingen.
The Laser, which was used at this time, was a JK 10 Joule Ruby Holographic Laser System (Model HLS 4)

In October 1984, we at JK Lasers Deutschland GmbH received an enquiry from Dr. Kompenhans of DFVLR in Göttingen, for a Laser system, capable of similar pulse separations as the HLS 10 but with a much faster repetition rate. The pulse energy could be less.

The only way to achieve a repetition rate in the range of 10 Hz was to use a frequency doubled Nd:YAG Laser system instead of a Ruby system.

At this time, this requirement was quite difficult to achieve with a single oscillator. The storage time of YAG is much shorter (230µs) than on a Ruby (1,2 ms). At interpulse separations of less than 230 µs, a very careful Q-switch control would be necessary to achieve balance of the pulse amplitudes.  JK Lasers in England refused to build such a system since the technical risk was to high.

After some deep discussions, between Hans Schürer and myself ( both from JK Lasers in Germany) and Clive Irland from JK Lasers in England, it was agreed that the best proposal would be to use two separate standard HyperYAG 200 Laser systems with orthogonal polarizations. The two beams could be combined via a polarizer prior to entering a KD*P-Type II doubling crystal.