Contribution ID: **19** Type: **not specified**

Coherent combining of a large number of fibers with an interferometric technique

Friday 28 June 2013 11:05 (10 minutes)

The challenge of producing the next generation of particle accelerators, both for fundamental research, or for more applied tasks such as proton therapy or nuclear transmutation has been taken up by the high intensity laser community. To reach the ultrahigh peak power and high average power requirements of these applications, coherent beam combination of thousands of fiber amplifiers has to be envisaged. Active phase locking solutions can be implemented using frequency tagging technique, heterodyne techniques or by analyzing the interference pattern of the output fibers recorded on a camera. The last method, we called interferometric technique, performs a collective measurement of the phase distribution with a single image measured on the sensor, and is therefore naturally more suited to very large number of fibers. We report CBC of the largest number of combined fibers (64) with this technique. We use a test-system to determine the scaling parameters of the architecture, and to finally estimate the maximal number of combined fibers with conventional hardware. Different strategies for the recombination of the multiple beams, including far field interferences or diffractive optical elements will be reviewed.

Author: BRIGNON, Arnaud (Thales)

Presenter: Dr BRIGNON, Arnaud (THALES)

Session Classification: ICAN - Technical Aspects