



	Experiment title: 2D vacuum-core x-ray waveguides and waveguide arrays characterization	Experiment number: HS-2010
Beamline: ID13	Date of experiment: from: 21 gennaio 2010 to: 25 gennaio 2010	Date of report: 30/July 2010
Shifts: 12	Local contact(s): Dr E. Ziegler	<i>Received at ESRF:</i>
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Report:

The principal aim of the experiment was the testing of 2D waveguides (WGs) , microfabricated at IFN-CNR in Rome. The fundamental difference with respect to the previously faricated 2D WGs [1] , was the ‘air gap’ which allows a higher efficiency.

The experiment performed at BM5 put in evidence some critical fabrication problems which suggested to follow new process for the WGs production. In particular the measurement showed a high roughness of the Au WG walls due to the galvanic growth process which degrades the efficiency with a dramatic reduction of the exiting guided X-ray beam.

The experiment results were essential to define the new strategy for the 2D WGs fabrication, in particular it came out that in order to have flat and smoothy surface a different fabrication procedure (“lift-off”) has to be preferred with respect to growth on plated surfaces..

The beam time was also used to test some standard vacuum gap 1D WGs with Cr walls. The test was succesfully carried out and a certain number of 1D WGs were selected for future 1D x-ray microscopy experiments.

[1] F. Pfeiffer, C. David, M. Burghammer, and T. Salditt, [*Science* **297**, 230 \(2002\)](#)