EUROPEAN **S**YNCHROTRON **R**ADIATION **F**ACILITY

INSTALLATION EUROPEENNE DE RAYONNEMENT SYNCHROTRON

ESRF

Experiment Report Form

The double page inside this form is to be filled in by all users or groups of users who have had access to beam time for measurements at the ESRF.

Once completed, the report should be submitted electronically to the User Office using the **Electronic Report Submission Application:**

http://193.49.43.2:8080/smis/servlet/UserUtils?start

Reports supporting requests for additional beam time

Reports can now be submitted independently of new proposals – it is necessary simply to indicate the number of the report(s) supporting a new proposal on the proposal form.

The Review Committees reserve the right to reject new proposals from groups who have not reported on the use of beam time allocated previously.

Reports on experiments relating to long term projects

Proposers awarded beam time for a long term project are required to submit an interim report at the end of each year, irrespective of the number of shifts of beam time they have used.

Published papers

All users must give proper credit to ESRF staff members and proper mention to ESRF facilities which were essential for the results described in any ensuing publication. Further, they are obliged to send to the Joint ESRF/ ILL library the complete reference and the abstract of all papers appearing in print, and resulting from the use of the ESRF.

Should you wish to make more general comments on the experiment, please note them on the User Evaluation Form, and send both the Report and the Evaluation Form to the User Office.

Deadlines for submission of Experimental Reports

- 1st March for experiments carried out up until June of the previous year;
- 1st September for experiments carried out up until January of the same year.

Instructions for preparing your Report

- fill in a separate form for each project or series of measurements.
- type your report, in English.
- include the reference number of the proposal to which the report refers.
- make sure that the text, tables and figures fit into the space available.
- if your work is published or is in press, you may prefer to paste in the abstract, and add full reference details. If the abstract is in a language other than English, please include an English translation.

ESRF	**Experiment title:** Laue case diffractive – refractive optics: first experimental test	**Experiment number**: MI751
Beamline BM05	**Date of experiment**: from: 4 November 2005 to: 7 November 2005	**Date of report**: 24 January 2006
Shifts: 9	**Local contact(s)**: Dr. Luca Peverini	*Received at ESRF:*

Names and affiliations of applicants (* indicates experimentalists):

Jaromir Hrdy* Institute of Physics, Academy of Sciences of the Czech Republic

Vito Mocella* CNR IMM

Peter Oberta* Institute of Physics, Academy of Sciences of the Czech Republic

Luca Peverini* ESRF

Kirill Potlovskiy* Russian Research Centre Kurchatov Institute

Report:

The possibility of the sagittal focusing of synchrotron radiation by an asymmetric Laue crystal with profiled surfaces was experimentally demonstrated for the first time. The sample was Si single crystal with two parallel holes of the diameter of 8 mm. The axes of the holes formed the angle of 7.95^0 with (111) diffracting planes and were arranged vertically with respect to the diffracting planes. The 15.35 keV synchrotron radiation was diffracted in the space between the holes. The minimum thickness of this Laue crystal was 0.5 mm. The diffracted beam formed the angle 0.55^0 with the exit surface. The experiment was performed at BM05 beamline in ESRF. The length of the beamline was not sufficiently long to detect the focus but the experiment clearly showed that the diffracted beam was sagittally convergent.

Fig. 1 shows the photographic picture of the Laue crystal

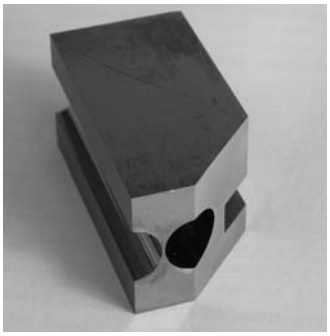

Fig. 1.

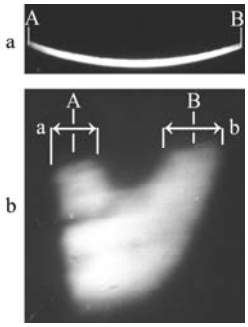

Fig. 2.

The images of the diffracted beam taken just after the crystal (a) and at the distance of 20 m from the crystal (b) are shown in Fig. 2.

It was suggested, that the aberrations seen in Fig.2 (sagittal and meridional spread of the diffracted beam) may be removed by using dispersive setting of two Laue crystals with profiled surfaces as it is shown in Fig. 3.

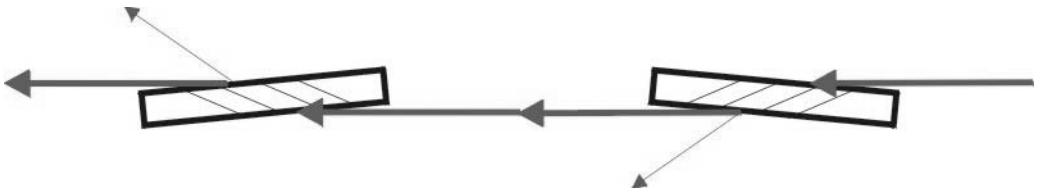

Fig. 3.

Hrdy, J., Hoszowska, J., Mocuta, C., Artemiev, N., & Freund A. (2003a). *J. Synchrotron Rad*. **10**, 233-235.