3) Providing (e-e)-Patterson vectors and (e-n)-vectors (without (n-n)-vectors as in a normal Patterson function) in correct space group symmetry from 2 wavelengths, both vector sets being added together.

A study of the practicability of these symmetry constraints and their limitations by experimental errors will be presented. It is based on test computations using the program described in the abstract by Konz, Spilker, Schäfer and K. Fischer (Abstract, XIII IUCr Congress, 1984).

Thanks are due to the Deutsche Forschungsgemeinschaft for financial support.

15.5–1 CRYSTALLIZATION OF METALLIC GLASSES STUDIED BY SYNCHROTRON X-RAY RADIATION. By

W.Minor, University of Warsaw, Poland, B. Schönfeld, Hamburger Synchrotronstrahlungs-labor, DESY, F.R.G, B.Lebech, Risø National Laboratory, Denmark, B.Buras, University of Copenhagen, Denmark and W.Dmowski, Technical University, Warsaw, Poland.

Metallic glasses containing Fe are soft magnetic materials with potential technological applications. When crystallizing they become brittle and lose their magnetic properties. Therefore studies of the crystallization process in metallic glasses are of both scientific and technological interest. Studies of the crystallization process have been made by us by means of x-ray synchrotron radiation and the energy dispersive method, which enable the recording of a full diffraction pattern in a relatively short time. The amorphous to crystalline transition were investigated in $Fe_xSi_{90}B_{10}$ (69<x<83). We used the white spectrum of the synchrotron radiation at DORIS (Hasylab) in the energy range up to 50 keV which for the scattering angle 21 corresponds to 11 $Å^{-1}$. The crystallization was followed either by heating the sample stepwise from 20 °C to 1000 °C or by repeatedly recording the diffraction patterns obtained from a sample while annealing at a fixed temperature close to the crystallization temperature. Several time series of isothermal patterns have been obtained and used to study the kinetics of the crystallization. The crystallization of α-Fe in $Fe_{83}Si_7B_{10}$ at 350 °C is nearly complete after 700 minutes.

15.4–9 STRUCTURAL STUDIES OF AMORPHOUS MATERIALS USING SYNCHROTRON RADIATION AND ANOMALOUS SCATTERING*. By

A. Bienenstock, A. Fischer-Colbrie, J. Kortright, R. Lorentz, K. Ludwig, W. Warburton, L. Wilson, Stanford Synchrotron Radiation Laboratory, Stanford University, SLAC Bin 69, P.O. Box 4349, Stanford, CA, 94305, USA and P. Fuoss, AT&T Bell Laboratories, Holmdel, NJ 07733 USA.

In this talk, applications of synchrotron radiation and anomalous x-ray scattering to the determination of short-range atomic coordinations in polyatomic amorphous materials will be discussed. The advantages and limitations of differential anomalous scattering (DAS) techniques will be reviewed. It will be shown that the DAS technique provides information which is not obtainable in any other way and vastly increases our ability to determine the coordinations of specific elements in amorphous materials, particularly when combined with EXAFS analysis. The degree of success we have achieved in obtaining valid partial distribution functions will be described.

*Supported in part by the NSF through the Stanford University Center for Materials Research and by the DoE through the Stanford Synchrotron Radiation Laboratory.

15.6–1 SMALL ANGLE SCATTERING ON SINGLE OSTEONS USING SYNCHROTRON RADIATION. By

A. Ascenzi*, A. Bigi**, M.H.J. Koch ***, A. Ripamonti**, and N. Roveri**,
* Istituto di Anatomia Patologica, Policlinico Umberto I, Universita' di Roma,Italy. **Istituto Chimico "G.Ciamician", Universita' di Bologna, Italy. *** EMBL Outstation Hamburg, c/o Desy Hamburg.

Small angle X-ray diffraction patterns of single osteons have been recorded using synchrotron radiation at EMBL c/o Desy, Hamburg. The first six meridional reflections corresponding to the collagen axial periodicity have been measured, whereas using X-ray conventional sources the first three reflections could be recorded only for the most ordered samples.

The intensity distribution of the meridional reflections is in agreement with a model in which inorganic blocks at the level of the main band of collagen fibrils are arranged with the same axial periodicty of the collagen structure.

The intensity distribution of the meridional reflections is different from that of the native collagen fibers. However, the appearance of the strong first and third reflections indicates that the projected electron density is a step-function. The falling off of the intensity can be ascribed to the height of the step, representing the inorganic blocks at the level of the main band of collagen fibrils and much greater of any other possible density fluctuation.