of relatively large blocks in a form of oriented "columns" grown on the seed crystal, which were strongly twisted around the column axis. These blocks, grown in space consisted of blocks, too, but the "columns" have smaller diameters and were much less twisted. Natural diamond crystals, parallel to the {111} plane, had been found in some parts of the crystal surface. The density of dislocations was similar in all crystal blocks (10^4 cm^{-2}). A thin layer of vapour-grown crystal covered partially the side walls of the seed crystal. A constant ratio of the characteristic line intensities for these elements along the crystal in Space and that on the Earth. The same refers to the cross-section plane perpendicular to crystal longitudinal axis, except for Pb and Se, where the distribution of these elements showed somewhat fluctuation. Some areas containing PbSe precipitates (density 1 x 10^4 cm^{-2}) in the seed crystal and also partially in the Earth-grown one were observed. The crystal grown in Space exhibited PbSe precipitates (density 1.5 x 10^4 cm^{-2}) in the bulk, and inclinations of (001) on the plane parallel to the boundary between the grown crystal and the seed part.

07.1-02 TWINNING OF EPITAXIAL DIAMOND FILMS GROWN FROM GASEOUS PHASE. By M.O. Kliya, A.E. Alexenko, B.V. Spitcin, Institute of Crystallography, Institute of Physical Chemistry of the USSR Academy of Sciences, Moscow, USSR.

Epitaxial diamond films were grown from the gaseous phase of carbon containing compounds at temperatures of about 1000°C and pressures less than 1 atm. The films were grown on the natural faces (111) of diamond as well as on (110) and (100) surfaces of polished diamond substrates. Film morphology was studied at room temperature. Samples were taken out of the chamber after each stage of growing, which made it possible to observe the surface of the films at different thicknesses. These repeated interruptions could lead to surface changes due to cooling and to additional defects arising from the interruptions. Growth layers and specific square figures of growth were always seen on (111), (110) and (100) surfaces. A thin layer of PbSe precipitates (density 1.5 x 10^4 cm^{-2}) in the seed crystal and also partially in the Earth-grown one were observed. The crystal grown in Space exhibited PbSe precipitates (density 1 x 10^4 cm^{-2}) in the bulk, and inclinations of (001) on the plane parallel to the boundary between the grown crystal and the seed part.

07.1-03 ADVANCES IN THE APPLICATIONS OF THE HOLOGRAPHIC INTERFEROMETRY TO THE STUDY OF CRYSTAL GROWTH FROM SOLUTION. By F.Bedarida and L.Zefiro (Istituto di Mineralogia), P. Ottolengo and C.Pontiggia (Istituto di Fisica), Università di Genova, Italy.

Changes of concentration near a crystal growing from a supersaturated solution have been investigated in the past by classic optical interferometry. Holographic interferometry gives the possibility of working in larger volumes (some tens of cm^3), where the convective movements affecting the growth process may be easily checked. In all these techniques, only a mean refractive index of the solution may be measured via the interference fringes produced by the overall optical path-length variations. A real three dimensional map of the refractive index variations is obtained from multi-directional holographic interferometry. Since the refractive index is generally a function not only of concentration but of temperature, too, the temperature variations near the interface of a growing crystal have been tested by thermocouple probe; values of the order of 10^{-2} °C have been measured during the growth of a NaClO_4 crystal from a 1% supersaturated solution. Therefore, the interference fringes obtained experimentally may be related directly to the distribution of concentration near the growing crystal.