1) In SAF-2507 type duplex stainless steels mathematical models were written by crystal-geometric methods into the orientation relationships between the body centred cubic ferrite, face centred cubic secondary austenite and tetragonal σ-phase the latter phases arisen by the isothermally decomposition of ferrite what mathematical models consider the crystal-symmetries and the changing of lattice-parameters, and the correctness of these mathematical models were verified by results of measurements:
   a) Mathematical model was written into the orientation relationship \( \begin{bmatrix} 110 \end{bmatrix}_f //\begin{bmatrix} 110 \end{bmatrix}_o \) and \( \begin{bmatrix} 332 \end{bmatrix}_o //\begin{bmatrix} 113 \end{bmatrix}_o \) between the ferrite and σ-phase determined previously by other method and the correctness of this model were verified by results of measurements.
   b) Mathematical model was written into the orientation relationship \( \begin{bmatrix} 100 \end{bmatrix}_s //\begin{bmatrix} 100 \end{bmatrix}_o \) and \( \begin{bmatrix} 032 \end{bmatrix}_o //\begin{bmatrix} 011 \end{bmatrix}_o \) between the secondary austenite and σ-phase determined previously by other method and the correctness of this model were verified by results of measurements.
   c) Mathematical model was written into the orientation relationship \( \begin{bmatrix} 111 \end{bmatrix}_s //\begin{bmatrix} 001 \end{bmatrix}_o \) and \( \begin{bmatrix} 101 \end{bmatrix}_o //\begin{bmatrix} 110 \end{bmatrix}_o \) between the secondary austenite and σ-phase determined previously by other method and the correctness of this model were verified by results of measurements.

2) It was found by my calculations and measurements that in SAF-2507 type duplex stainless steels the orientation relationship between the secondary austenite and σ-phase is written with more accuracy (it means fewer average deflection between the measured and calculated results and means fewer spread) by \( \begin{bmatrix} 111 \end{bmatrix}_s //\begin{bmatrix} 001 \end{bmatrix}_o \) and \( \begin{bmatrix} 101 \end{bmatrix}_o //\begin{bmatrix} 110 \end{bmatrix}_o \) than \( \begin{bmatrix} 100 \end{bmatrix}_s //\begin{bmatrix} 100 \end{bmatrix}_o \) and \( \begin{bmatrix} 032 \end{bmatrix}_o //\begin{bmatrix} 011 \end{bmatrix}_o \).

3) On different durations isothermally heat treated specimen made from SAF-2507 type duplex stainless steel it was found that the orientation-differences between the ferrite, secondary austenite and σ-phases the latter phases arisen by the isothermally decomposition are independence from the duration of heat treatment; furthermore it was found that angle-deviations between the calculated and measured orientations are much fewer when a parent-inherited relation may be hypothesized between the studied grains, subgrains. A parent-inherited relation may be hypothesized between two given grains with greater chance when a σ-phase grain can be found between a ferritic and austenitic grain.