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Application of the non linear regression on the 3-D and 2-D coordinates transformation problem. Case of Algeria.

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The global transformation models as Bursa-Wolf and Molodensky-Badekas are famous methods used to compute transformation parameters between geodetic systems.

In our case, for a huge territory like Algeria, these models are not most appropriate to give good accuracies, because of lack of information about the local geoid over the non geocentric ellipsoid Clarke 1880 (called Nord-Sahara'59), while the two dimension models such as geodetic lines and multiple regression have given best results. In all cases, the computation method is the traditional least squares adjustment.

The paper's main objective is the transformation of geodetic control from the old Algerian system Nord-Sahara'59 to the new WGS84 datum using different methods of nonlinear least squares adjustment.

The tests carried out concerned the application of these methods to compute the transformation parameters in the three-dimensional case (global transformation models) and in the two-dimensional case (local transformation models).

Conclusions and recommendations are given with respect to the suitability, accuracy and efficiency of each method.