

# ISO Geodetic Registry

|                           |   |  |
|---------------------------|---|--|
| <i>Item class</i>         | Transformation  |  |
| <i>Name</i>               | <b>ITRF91 to ITRF2020 [IERS v1]</b>   |  |
| <i>Item status</i>        | VALID   |  |
| <i>Identifier</i>         | 808   |  |
| <i>Information source</i> | <i>Title</i>  | Transformation parameters from ITRF2020 to past ITRFs  |
|                           | <i>Author</i>   | International Earth Rotation and Reference Systems Service (IERS)  |
|                           | <i>Publisher</i>  | Institut National de l'Information Geographique et Forestiere (IGN)  |
|                           | <i>Publication date</i>   | 2022-04-15   |
|                           | <i>Other citation details</i>   | Webpage: <a href="https://itrf.ign.fr/docs/solutions/itrf2020/Transfo-ITRF2020_TRFs.txt">https://itrf.ign.fr/docs/solutions/itrf2020/Transfo-ITRF2020_TRFs.txt</a> (accessed 2022-04-25) |
| <i>Data source</i>        | ISO Geodetic Registry   |  |
| <i>Remarks</i>            | The IERS citation describes the transformation. Accuracy of transformation is given at the reference epoch for the transformation parameters. Accuracy at other epochs depends on the accuracies of the parameters at the reference epoch and their rates of change. Refer to citations for accuracies of the parameters and their rates of change. |  |
| <i>Operation version</i>  | IERS v1   |  |
| <i>Scope</i>              | Spatial referencing   |  |
| <i>Operation accuracy</i> | 0.001 m   |  |
| <i>Source CRS</i>         | ITRF91 - XYZ  |  |
| <i>Target CRS</i>         | ITRF2020 - XYZ  |  |
| <i>Operation method</i>   | Time-Dependent Position Vector Transformation (geocentric Cartesian domain)   |  |

## Extent

|                                |                             |        |
|--------------------------------|-----------------------------|--------|
| <i>Description</i>             | <b>World</b>                |        |
| <i>Geographic Bounding Box</i> | <i>West-bound longitude</i> | -180.0 |
|                                | <i>North-bound latitude</i> | 90.0   |
|                                | <i>East-bound longitude</i> | 180.0  |
|                                | <i>South-bound latitude</i> | -90.0  |

## Operation parameter values

|   |                                |
|---|--------------------------------|
| <i>Time reference</i>                       | 2015.0 year                    |
| <i>Rate of change of scale difference</i>   | -0.12 millimetre per year      |
| <i>Rate of change of Z-axis rotation</i>    | -0.02 milliarc-second per year |
| <i>Rate of change of Y-axis rotation</i>    | 0.0 milliarc-second per year   |
| <i>Rate of change of X-axis rotation</i>    | 0.0 milliarc-second per year   |
| <i>Rate of change of Z-axis translation</i> | 3.1 millimetre per year        |
| <i>Rate of change of Y-axis translation</i> | 0.6 millimetre per year        |
| <i>Rate of change of X-axis translation</i> | -0.1 millimetre per year       |
| <i>Scale difference</i>                     | -4.67 parts per billion        |
| <i>Z-axis rotation</i>                      | -0.36 milliarc-second          |
| <i>Y-axis rotation</i>                      | 0.0 milliarc-second            |
| <i>X-axis rotation</i>                      | 0.0 milliarc-second            |

|                           |                  |
|---------------------------|------------------|
| <i>Z-axis translation</i> | 91.9 millimetre  |
| <i>Y-axis translation</i> | -12.1 millimetre |
| <i>X-axis translation</i> | -26.5 millimetre |

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|                    |  |
|--------------------|--|
| <i>Item class</i>  | OperationMethod  |
| <i>Name</i>        | <b>Time-Dependent Position Vector Transformation (geocentric Cartesian domain)</b>   |
| <i>Item status</i> | VALID  |
| <i>Identifier</i>  | 82   |
| <i>Alias</i>       | Time-Dependent 7-Parameter Transformation  |
| <i>Alias</i>       | 14-Parameter Transformation  |
| <i>Alias</i>       | Time-Dependent Position Vector Transformation  |
| <i>Data source</i> | ISO Geodetic Registry  |
| <i>Remarks</i>     | Note the analogy with the rotation for the Time-dependent Coordinate Frame Transformation but beware of the differences! The Position Vector Transformation convention is used by IAG. |
| <i>Formula</i>     | Geomatics Guidance Note No 7, part 2: Coordinate Conversions and Transformations including Formulas  |

## Operation parameters

|   |
|---|
| <i>X-axis translation</i>                   |
| <i>Y-axis translation</i>                   |
| <i>Z-axis translation</i>                   |
| <i>X-axis rotation</i>                      |
| <i>Y-axis rotation</i>                      |
| <i>Z-axis rotation</i>                      |
| <i>Scale difference</i>                     |
| <i>Rate of change of X-axis translation</i> |
| <i>Rate of change of Y-axis translation</i> |
| <i>Rate of change of Z-axis translation</i> |
| <i>Rate of change of X-axis rotation</i>    |
| <i>Rate of change of Y-axis rotation</i>    |
| <i>Rate of change of Z-axis rotation</i>    |
| <i>Rate of change of scale difference</i>   |
| <i>Time reference</i>                       |