# EFC-400 Release 2024 – new Libraries and Functions

Overview of the new features:

- ❑ Isolines-DXF-export shifted to double in order to avoid rounding errors
- ❑ Detailed log-file of the calculated induced current with complex values
- ❑ Command line parameter '/LFHF' for simultaneous LF- and HF-calculation
- ❑ Calculation of multiple projects of entire directories via CMD
- ❑ Construction of 1- and 2-conductor cables now possible
- ❑ New command line parameter '/saveclose'

## Extension of Libraries:

- A new example 'train_and_repeater.geo' of a train with an antenna system on board is included in the high frequency version. This model can also be found in the antenna library with the name 'Train'.

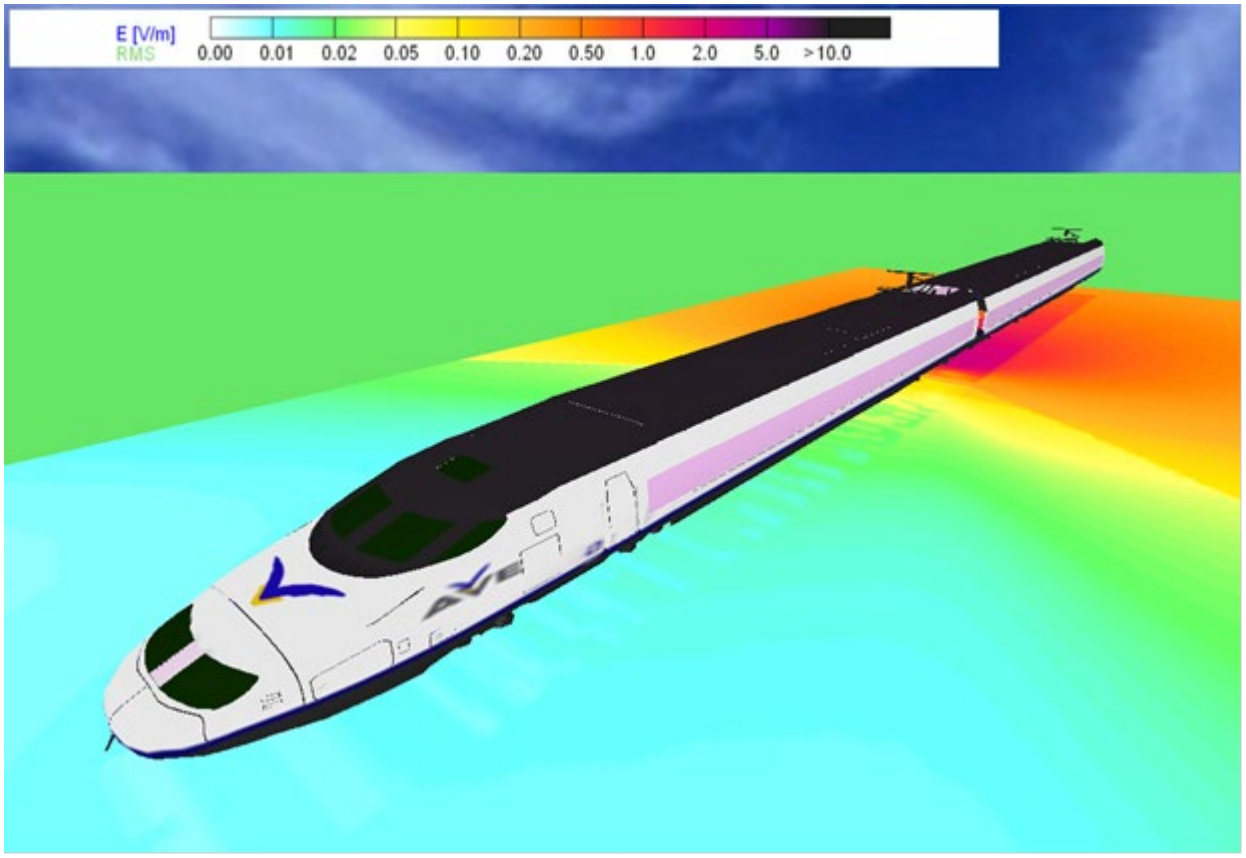



*Fig.: new example of a train with internal antenna*

## New Calculation Functions:

- After a calculation, both, induced currents and induced voltages are displayed in the geometry list. A log-file with the name 'induction_tab.log' is created in the work directory. This file contains complex currents and voltages as well as the complex impedance per unit length.

Mappe1

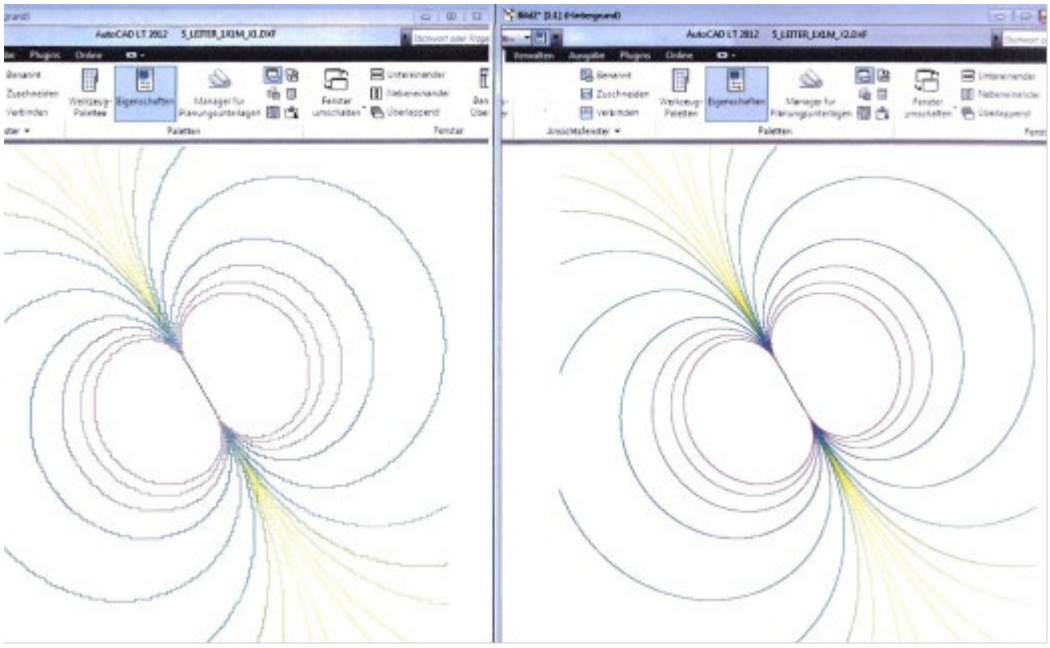
| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GW #n[] | U[V] | U_phi[deg] | U_re[V] | U_im[V] | I[A] | I_phi[deg] | I_re[A] | I_im[A] | Z_re[Ohm | Z_im[Ohm] |
| 2 | 7 | 3.533 | 28.8 | 3.097 | 1.7 | 34.291 | 333.2 | 30.6 | -15.475 | 0.05822 | 0.08501 |
| 3 | 14 | 4.994 | 28.1 | 4.405 | 2.354 | 44.129 | 332.5 | 39.153 | -20.359 | 0.06394 | 0.09338 |
| 4 | 21 | 2.991 | 5.9 | 2.975 | 0.308 | 33.465 | 310.3 | 21.651 | -25.517 | 0.0505 | 0.07374 |
| 5 | 28 | 3.485 | 14 | 3.382 | 0.84 | 37.008 | 318.4 | 27.657 | -24.591 | 0.0532 | 0.07769 |
| 6 | 35 | 2.687 | 6.7 | 2.668 | 0.316 | 37.639 | 311.2 | 24.768 | -28.341 | 0.04033 | 0.0589 |
| 7 | 42 | 2.521 | 15.6 | 2.428 | 0.679 | 34.963 | 320 | 26.791 | -22.465 | 0.04075 | 0.0595 |
| 8 | 49 | 11.173 | 23.3 | 10.264 | 4.414 | 51.278 | 327.7 | 43.329 | -27.422 | 0.12311 | 0.17977 |
| 9 | | | | | | | | | | | |

Tabelle1 Tabelle2 Tabelle3

*Fig.: presentation of ‚induction_tab.log' in EXCEL*

## Cartographical Data:

- The export of calculation data as DXF-isolines was modified from the number format single (left picture) to double (right picture), so that rounding errors do not occur anymore in exported isolines, when working with UTM-coordinates.



- In the dialog box for background map import, the resolution is now set to 300 dpi and the map scale to 1:10.000 by default.

## New Construction Functions:

- In the function ‘Construct cable' it is now possible to insert 1 as the number of phases of a cable. Using 'Connect', the 1-conductor-cable is rounded at the corners, too.

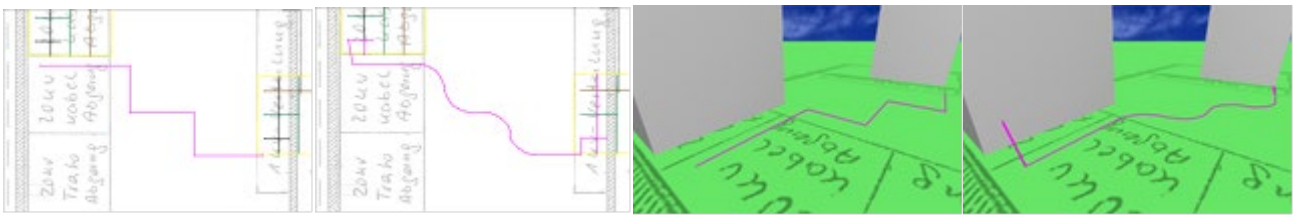
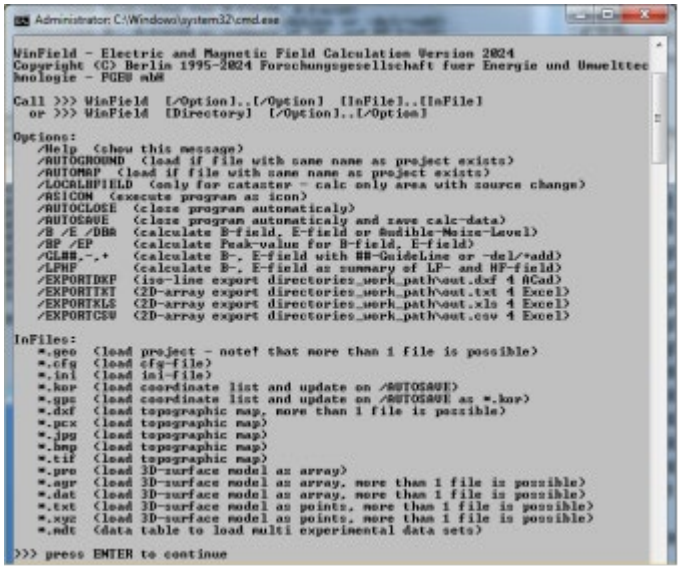


*Fig.: Connection of a 1-phase-cable rounded off automatically while connected*

# General Improvements:

- Projects are always saved and opened together as geometry (*.geo) and configuration (*.cfg). If the configuration is missing, e.g. during 'third-party-export', an error message: 'Configuration (*.cfg) not found!' is displayed to indicate that the processing/calculation is carried out with an arbitrary - the last loaded - configuration.
- In addition to the function ’/autoclose’ there is now the function ’/saveclose’ which saves the calculation data before closing the program. The present ’/autoclose’ function has not become redundant by that, since it is usefull when calculations are carried out in order to export data without saving the calculation results themselves.
- On the CMD, not only the filename of a geometry can now be specified for the calculation, but alternative a directory from which all geometries are calculated one after the other.
- There is a new CMD parameter ‘/LFHF’ with which the simultaneous LF and HF calculation is carried out.

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