

# CSEM Implementation File

New in control.dat

EM_METHOD
1

Default=0

0→MT

1→CSEM

2→CSEM+MT(in future?)

## Input files

File name	Content
control.dat	Parameters controlling FEMTIC
mesh.dat	Data of computational mesh
resistivity_block_iter[Iter#].dat	Data of parameter cells and initial resistivity values
observe.dat	Observation data
distortion_iter[Iter#].dat	Initial parameters of galvanic distortion

+ source.dat

If EM\_METHOD=CSEM in control.dat

## Some samples of new file added into FEMTIC

 ObservedDataSource.cpp	2025/11/13 14:50	C++ Source	25 KB
 ObservedDataSourceAED.cpp	2025/9/21 21:37	C++ Source	10 KB
 ObservedDataSourceAMD.cpp	2025/9/21 21:37	C++ Source	10 KB
 ObservedDataSourceSLS.cpp	2025/9/22 11:16	C++ Source	29 KB
 ObservedDataSourceSTLS.cpp	2025/11/13 14:51	C++ Source	64 KB
 ObservedDataStationCSEM.cpp	2025/9/21 21:37	C++ Source	87 KB

# Modification of Forward Modeling Loop

MT → 2 Polarizations (Ex , Ey) for one frequency (**Loop times: 2**)

CSEM → N source for one frequency (**Loop times: N**) with the same boundary condition

MT

```
if(m_typeOfElectromagneitcMethod == MT) {  
    for (int iPol = 0; iPol < 2; ++iPol) {  
  
        std::string polarizationName;  
        if (iPol == 0) {  
            polarizationName = "Ex-polarization";  
        }  
        else {  
            polarizationName = "Ey-polarization";  
        }  
    }  
}
```

CSEM

```
else if (m_typeOfElectromagneitcMethod == CSEM) {  
    for (int iSource = 0; iSource < pObservedData->getNumOfTotalSources(); ++iSource) {  
        int iPol = 0;
```