EDISON

Electromagnetic Design of
flexIble SensOrs

FNP Team-Tech

RBM for problems with non-affinite frequency dependence

(czyli raport o kolorowaniu grafów)

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1 Introduction

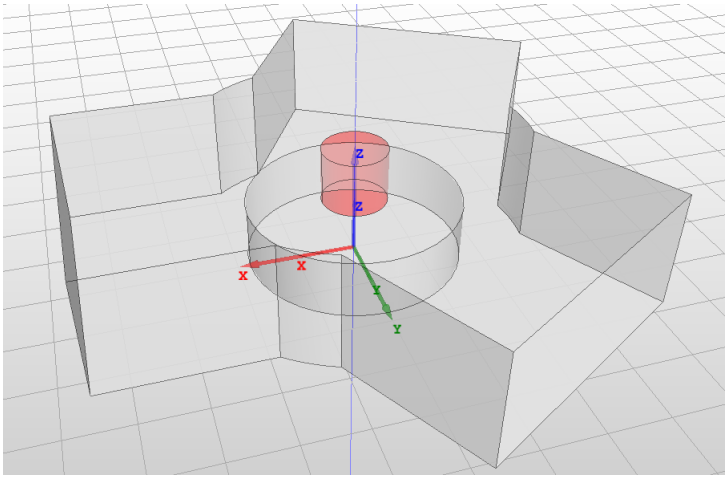
The aim of this report is to develop the reduced-basis method (RBM) approach for problems with non-affinite frequency dependence. For such structures the FEM system matrices have to be generated for each frequency independently. This property has a huge impact on the reduction approach such as standard RBM or RGM-MOR - it is not possible to efficiently assess the error in each reduction iteration, nor to select the next expansion point in a greedy way.

We propose a bisection kind reduction approach in which the next expansion frequency points are chosen in such a way that the frequency sub-bands are divided in two....

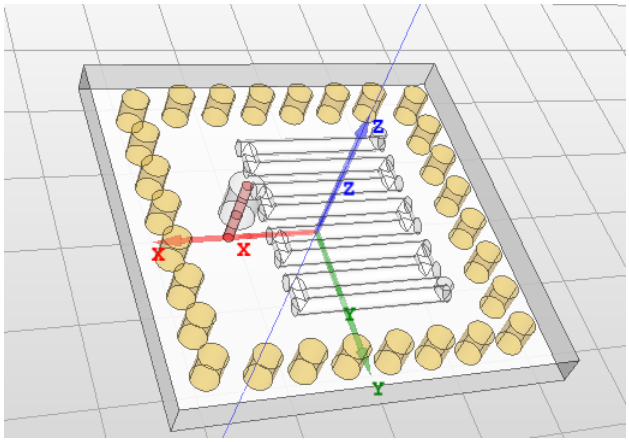
Algorytm trzeba jeszcze szczegółowo opisac.

- green dots - initial expansion points
- red dots - frequency points in which estimator has been computed and has been **above** the tolerance, therefore the snapshot has been generated and added to the projection basis.
- blue dots - frequency points in which estimator has been computed and has been **below** the tolerance, therefore the snapshot has not been generated and this section is assumed to be converged.

The numerical test deals with the *ferrite circulator*:

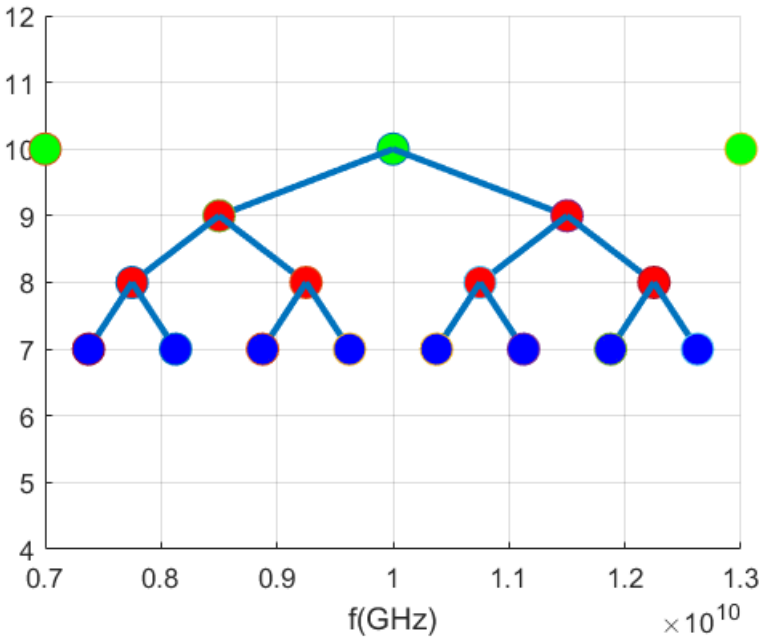


Pavia fluid sensor with bulk conductor

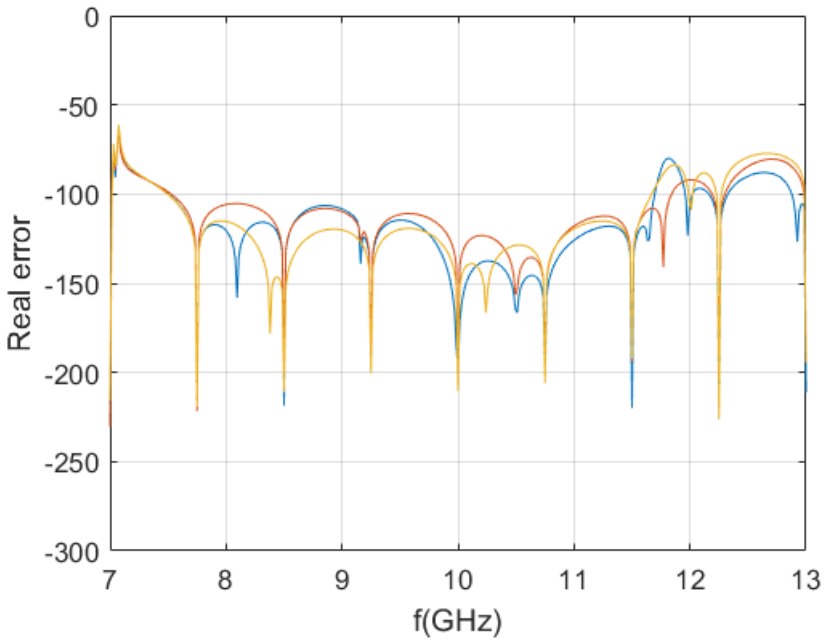


1.1 Circulator (tolerance 1e-3)

The graph:

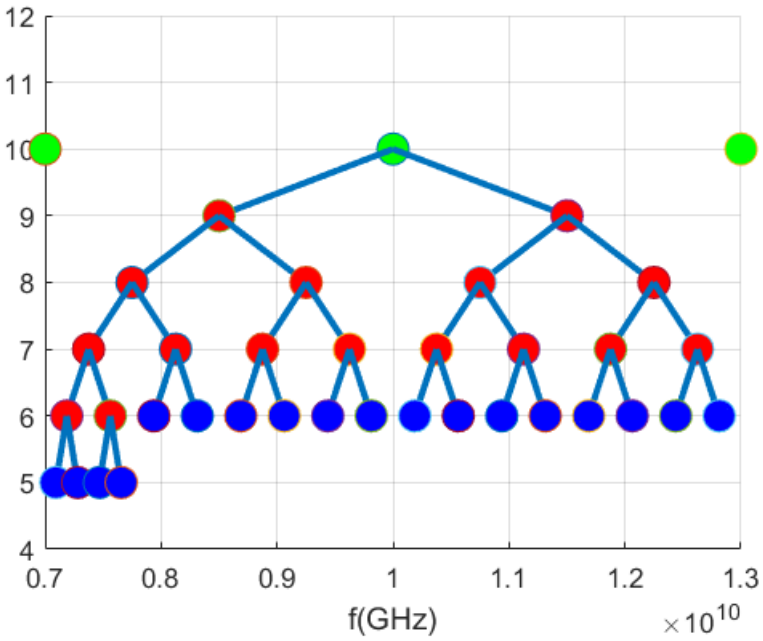


The real error:

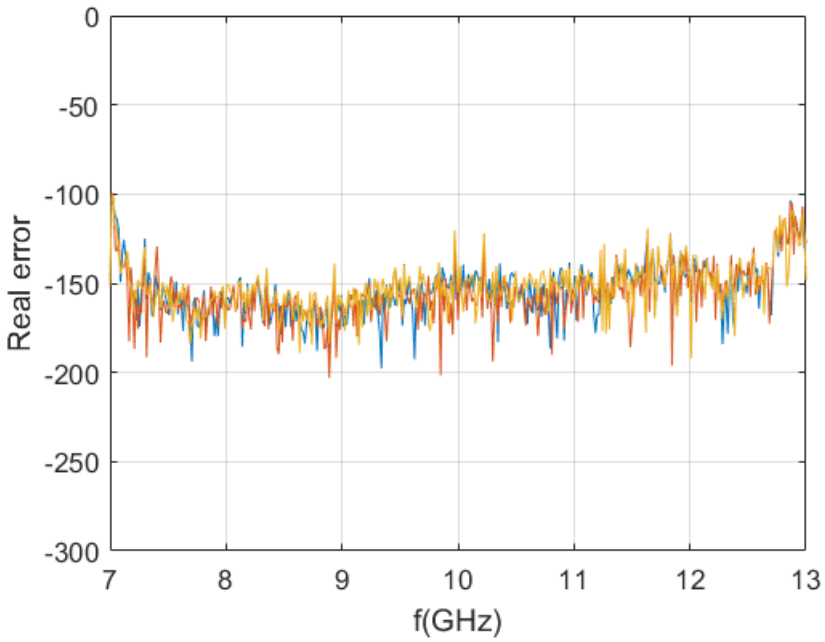


1.2 Circulator (tolerance 1e-6)

The graph:

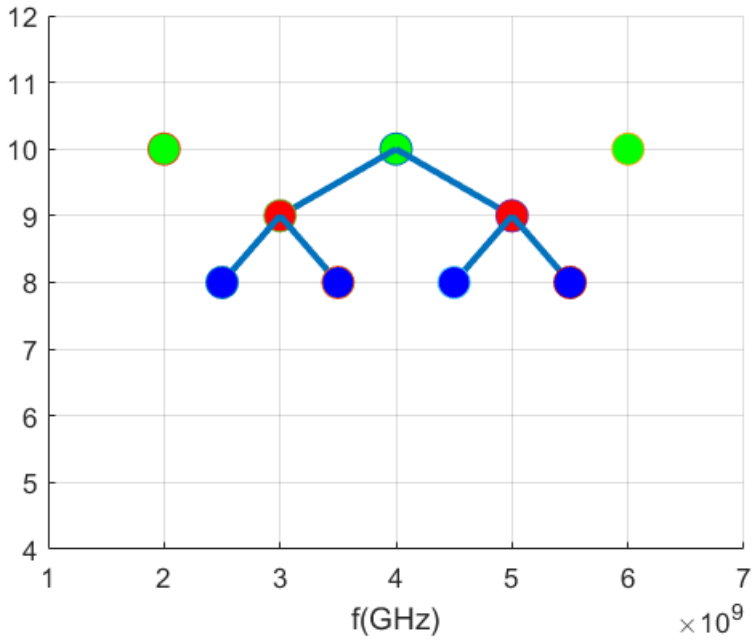


The real error:

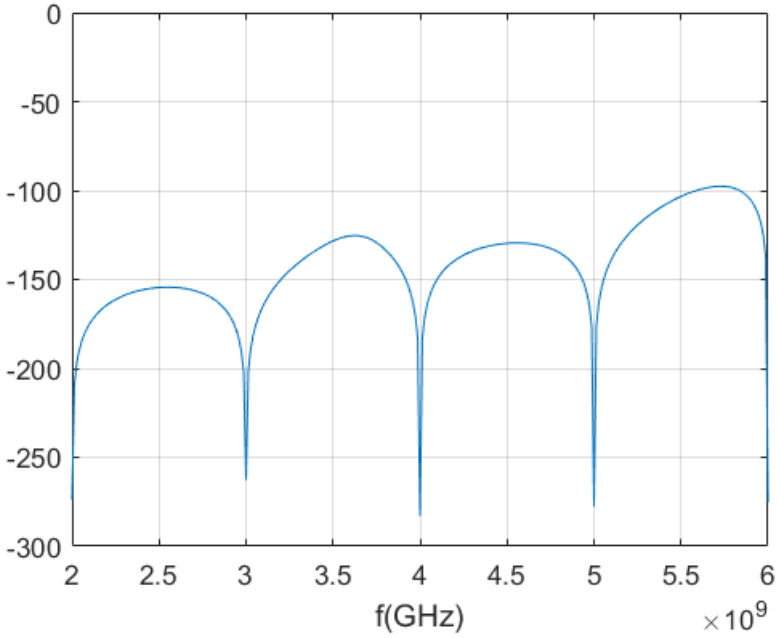


1.3 Pavia fluid sensor (tolerance 1e-2)

The graph:

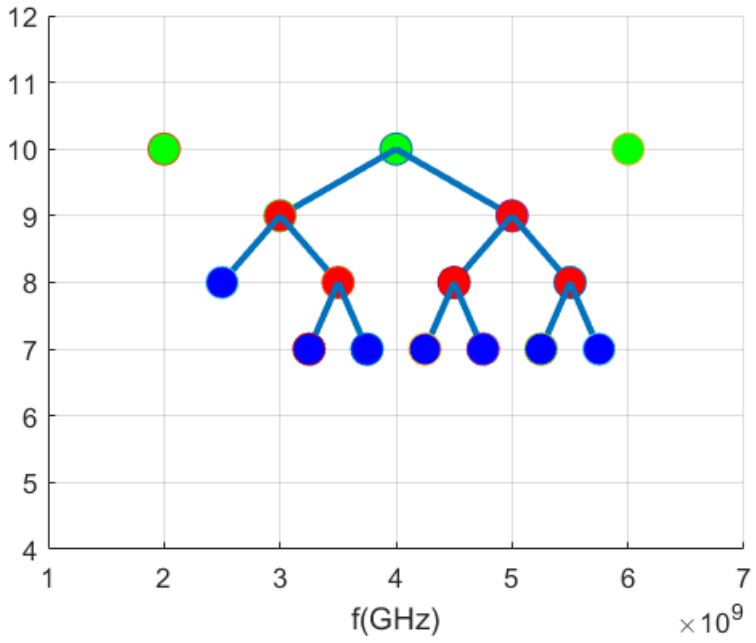


The real error:

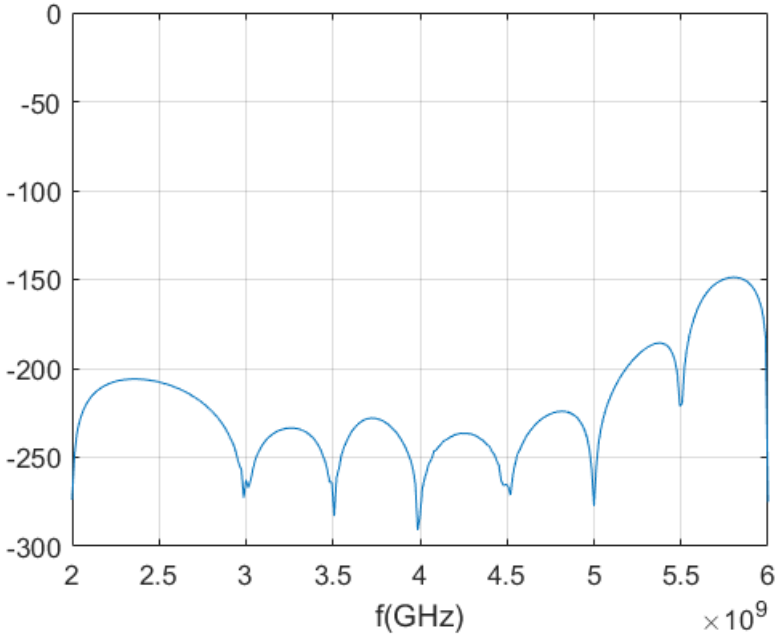


1.4 Pavia fluid sensor (tolerance 1e-3)

The graph:

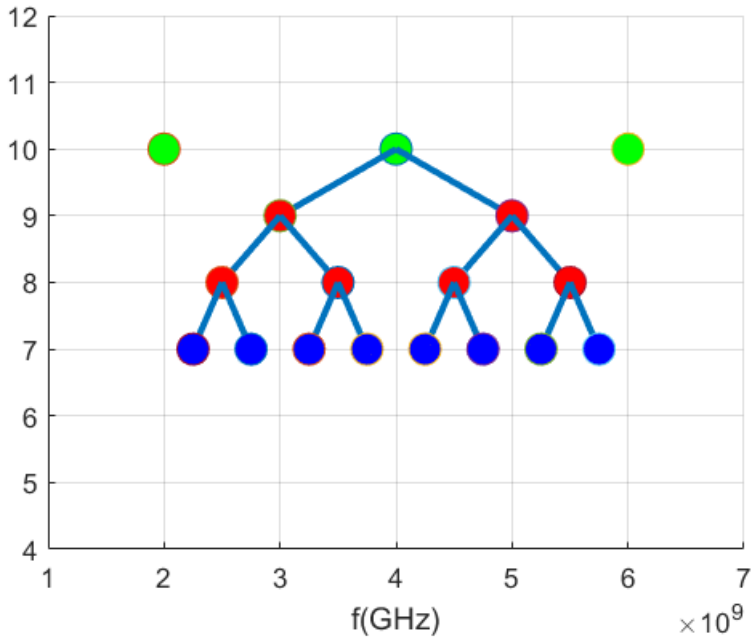


The real error:

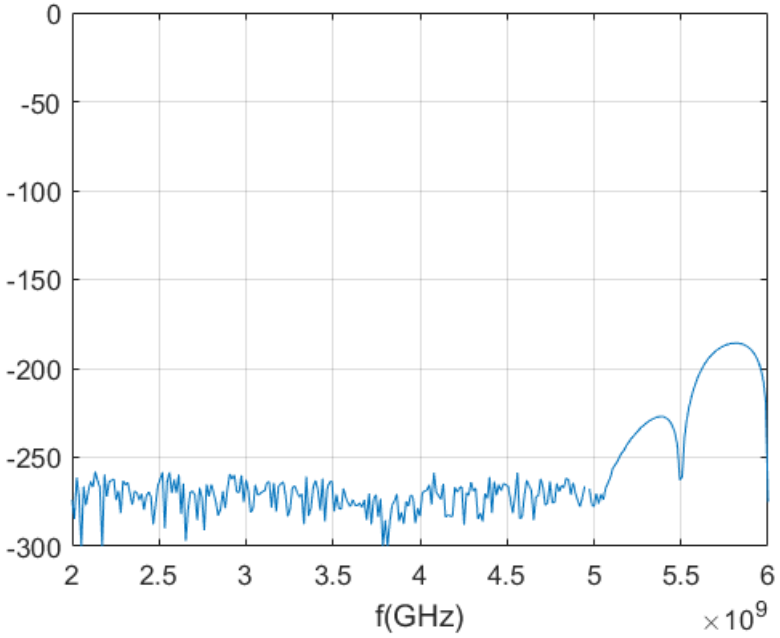


1.5 Pavia fluid sensor (tolerance 1e-4)

The graph:

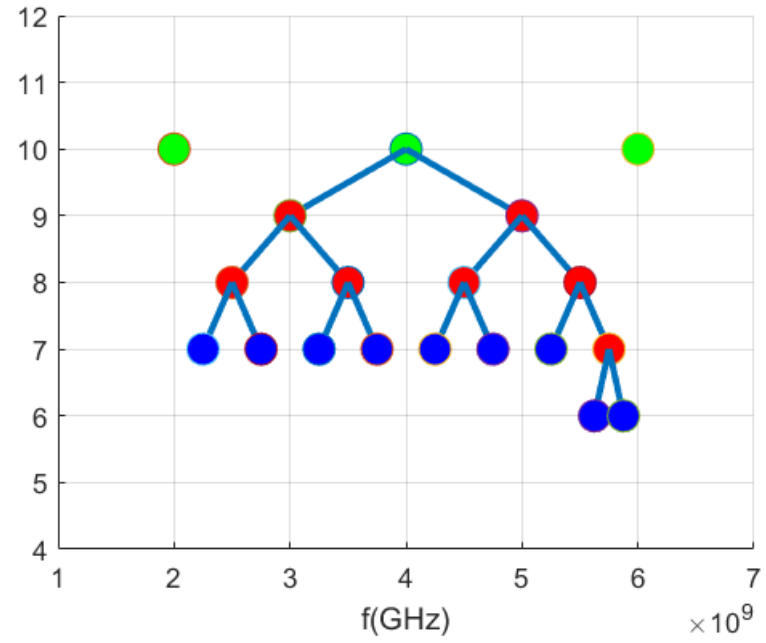


The real error:

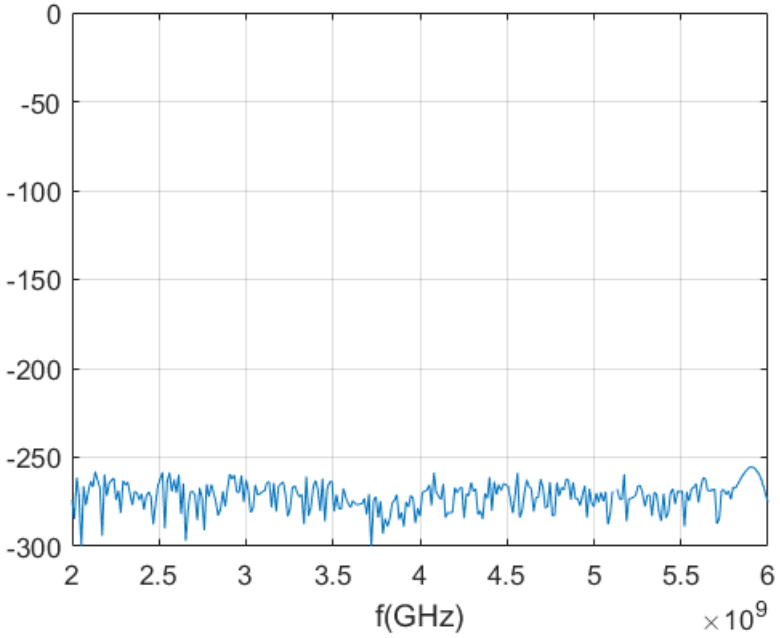


1.6 Pavia fluid sensor (tolerance 1e-5)

The graph:

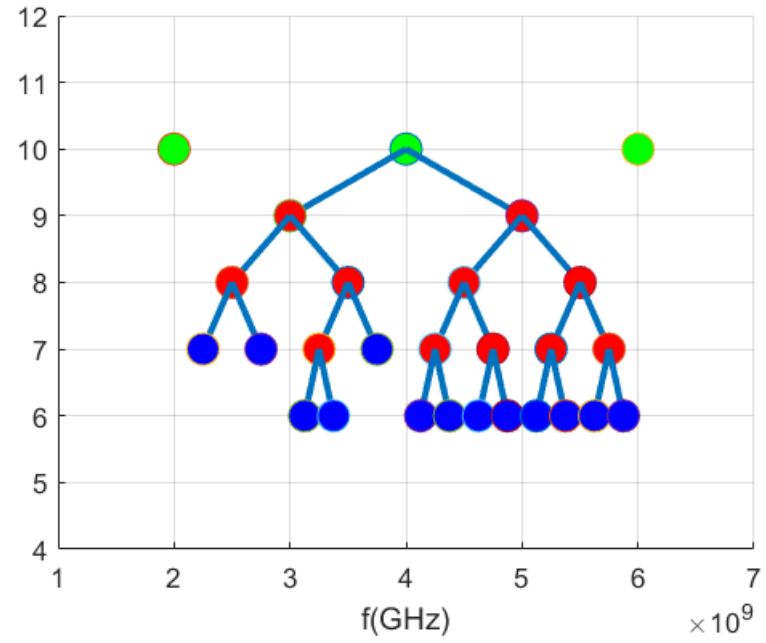


The real error:



1.7 Pavia fluid sensor (tolerance 1e-6)

The graph:



The real error: