EDISON

Electromagnetic Design of
flexIble SensOrs

FNP Team-Tech

Report 91 SLEPC for lossy surface

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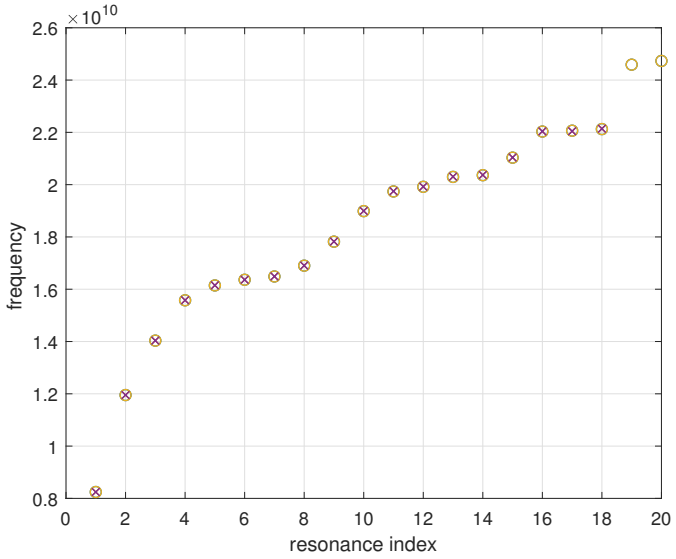

Figure 1: Nonlossy case, resonant frequencies, o - analytical solution, x - inventSIM (22.86mm×10.16mm×30mm box).

1 Nonlossy case

Box: 22.86mm×10.16mm×30 mm. Resonant frequecies: Fig 1, and tab. below.

k	f [GHz]
172.7788902375896	8.243877215534543
250.5019485926159	11.952312597967991
294.1283704608714	14.033879765927290
326.4631847112970	15.576685360413224
338.3759767757345	16.145085787909728
342.9028460224631	16.361078344578505
345.5577804751792	16.487754431069085
354.2097242753986	16.900568532760754
373.4660524181642	17.819354413447375
397.9487531180598	18.987508568142314

2 Lossy case

The same example, however the boundary conditions are made of conducting surfaces (characterized by sigma). Method used to solve nonlinear eigenproblem: Polynomial interpolation. A matrix polynomial is built by evaluating the operator at a few points, then PEP is used to solve the polynomial eigenproblem.

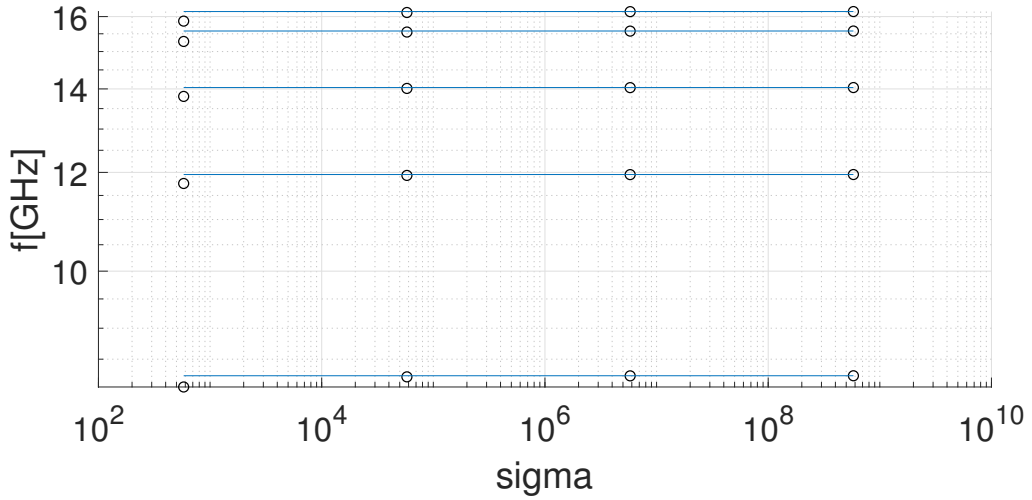

Figure 2: Lossy case, as a function of sigma. Real part of resonant frequencies. Blue lines: resonances of nonlossy problem.

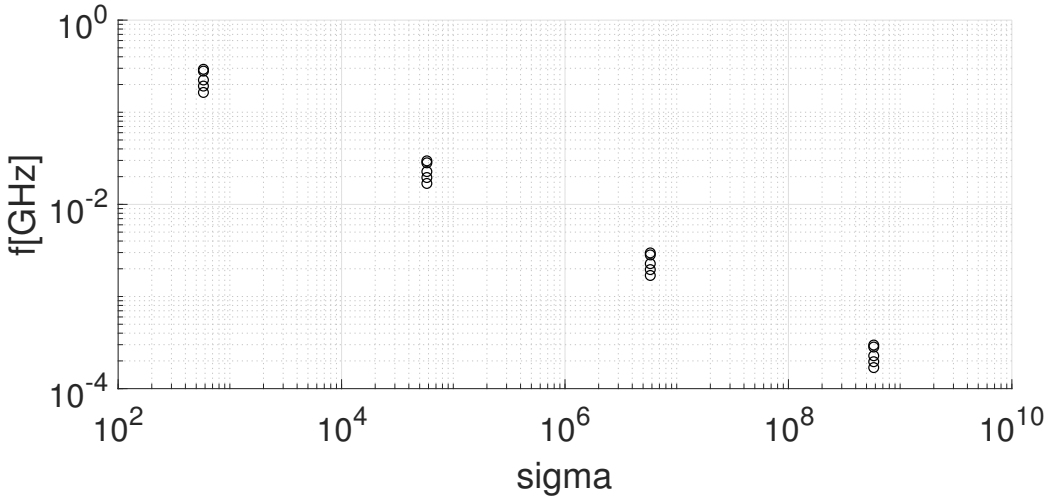

Figure 3: Lossy case, as a function of sigma. Imag part of resonant frequencies.