EDISON

Electromagnetic Design of
flexIble SensOrs

FNP Team-Tech

Report 92 Hua Guo reference

dr eng. Grzegorz Fotyga
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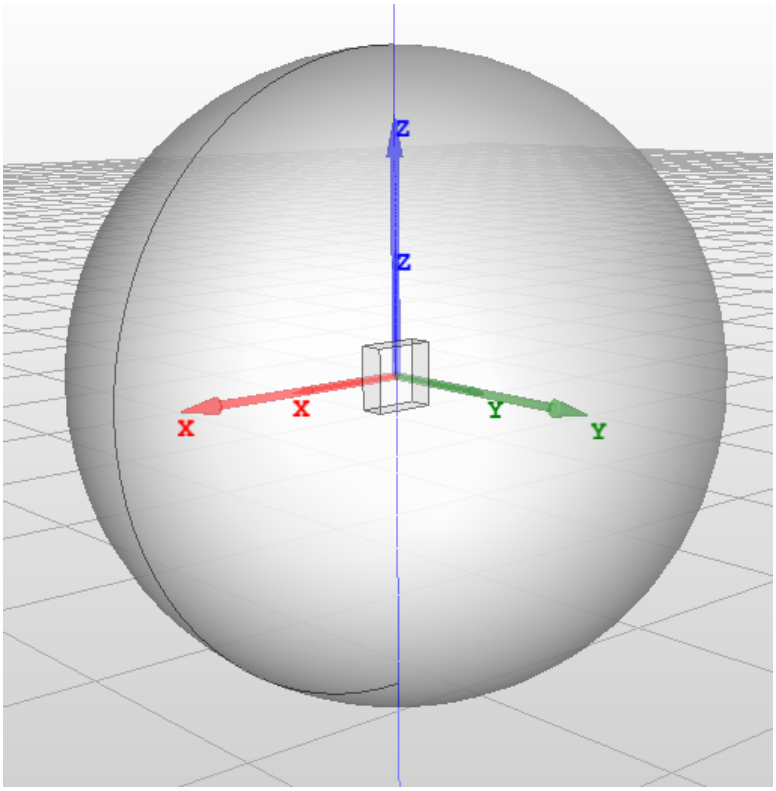

Figure 1: Box: 10mm×10mm×4 mm, r (to ABC): 50mm.

The goal of the rep. is to analyse the structures included in :

- Guo, Hua. 3-dimensional eigenmodal analysis of electromagnetic structures. Diss. ETH Zurich, 2012.
  `https://www.research-collection.ethz.ch/bitstream/handle/20.500.11850/62178/eth-6465-02.pdf`

1 3.4.1 Dielectric resonator antenna, page 38

Results:

- REF: R. K. Mongia and A. Ittipiboon. Theoretical and experimental investigations on rectangular dielectric resonator antennas. IEEE Trans. Antennas Propag., 45(9):1348–1356, 1997.
- GUA PhD
- SLEPC

Radius r (to ABC): 50mm 1.

Size	ϵ_R	f_{REF} [GHz]	f_{GUA} [GHz]	f_{slepc} [GHz]	Q_{REF}	Q_{GUA}	Q_{slepc}
10mm×10mm×4 mm	20	6.409	6.545	6.701	18.1	13.4	16.55
8.6mm×8.6mm×2.58 mm	37.84	5.934	6.221	6.275	37.9	31.3	35.2
7.45 mm×7.45 mm×2.98 mm	79.46	4.346	4.644	4.648	128.7	174.4	110.27

2 6.3.1 Pillbox cavity

Let radius and length of the pillbox be $r = 0.05$ m and $h = 0.1$ m, respectively.

σ	f_{GUA} [GHz]	f_{slepc} [GHz]	Q_{GUA}	Q_{slepc}
1e10	2.295229	2.29486 [GHz]	317255	318265
5.8e7	2.295160	2.29481	24160	24153
1e5	2.2934	2.2937	1001	1002
100	2.2381	2.25866	30	31.37