

**Short Report on My Participation in
2nd International Conference on Electrical, Communication and Computer Engineering in Turkey,
12-13 June 2020.**

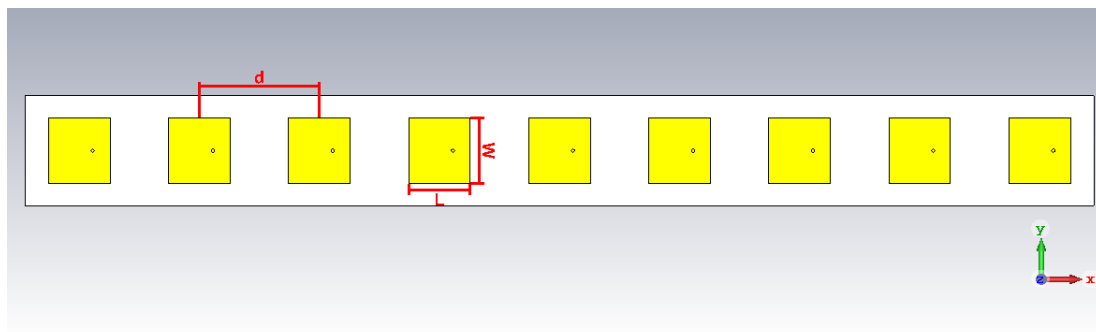
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*My Virtual Presentation in the 2nd International Conference on Electrical,
Communication and Computer Engineering, Istanbul, Turkey*

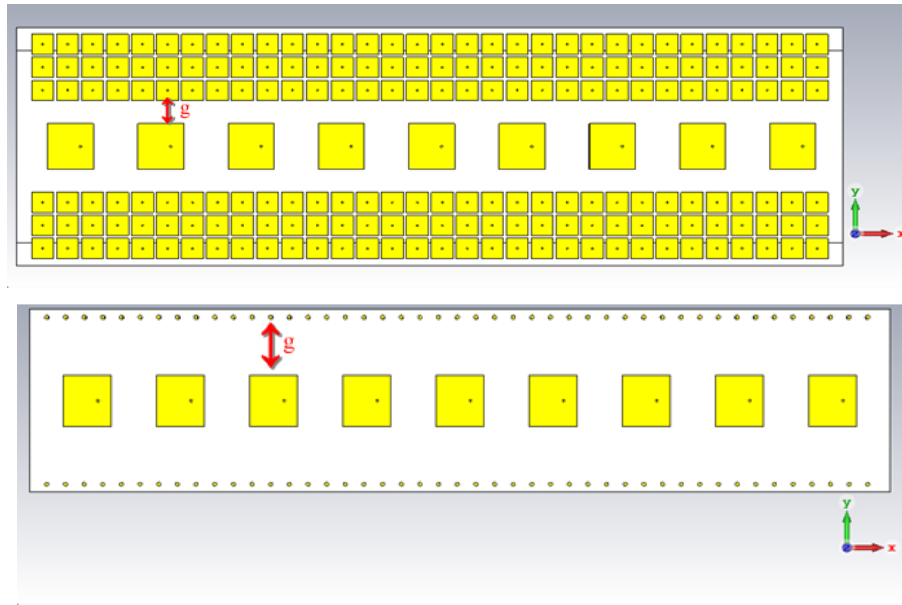
Having finished my internship with the topic of “Grating Lobe Reduction in Phased Array Antennas Using Passive Structures” at IHF, I wrote a paper to the ICECCE 2020 conference. This conference covers recent developments in the areas related to antennas and propagation, topics where I found very interesting. I submitted my paper in April, the committees accepted my paper for oral presentation and included the paper into the *antennas and propagation* session.

My internship project (and also my paper) is based on the previous work, on the development of HIS structures in a phased array antenna, which has been simulated at IHF. My focus is to design Electromagnetic Bandgap (EBG) and Bed of Nails (BON) structures and then integrate it to the phased array antenna. Taconic TLY-5 substrate material is chosen to show that this technique is flexible to use in a different substrate material. The high impedance structures (HIS) are introduced and used as a solution to suppress the grating lobe without changing the distance between elements.

Because of HIS bandgap feature, HIS does not support the surface wave due to the very high effective impedance. In the frequency range where the surface impedance is very high, the tangential magnetic field is small. My main work is to investigate the antenna performance before and after the integration. I found that both EBG and BON structure deliver higher gain and significant grating lobe suppression compared to the array without HIS.



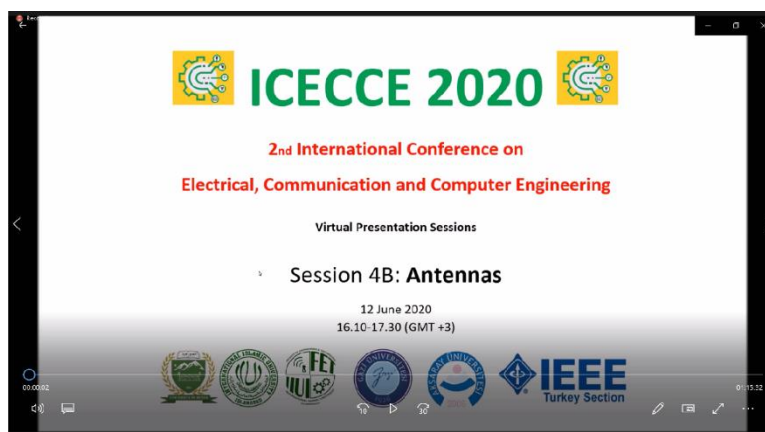
The reference antenna (phased array antenna without HIS).

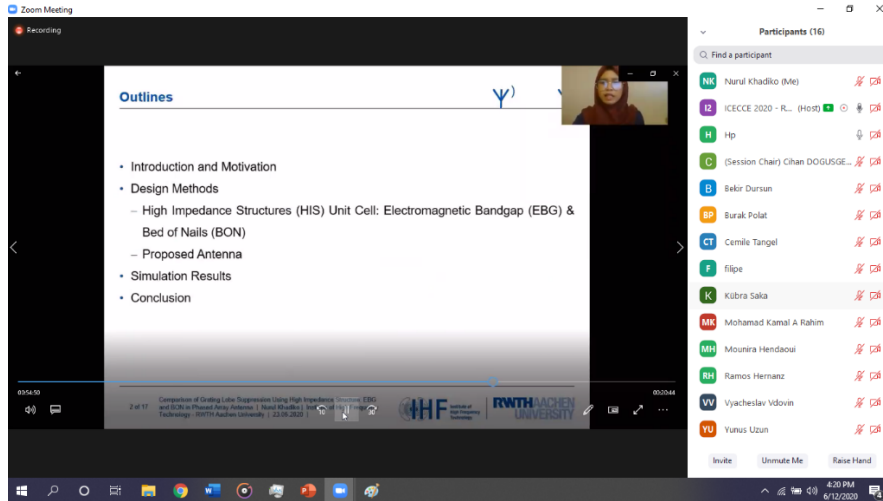


The design antenna with EBG and BON structures.

Unfortunately, the new Corona virus has spread all over the world. Turkey has been affected slightly. In the conference, participants were also given the opportunity to make virtual (remote) presentation without any problem, and the papers also still will be submitted to IEEE.

I presented my paper on June 12th, 2020, on the first day of the conference. It is in the *antenna and propagation* (part 4B) session. The ICECCE conference held in 4 parallel sessions simultaneously via the Zoom program on 12-13 June 2020. The authors were able to attend the sessions they want. To participate in the sessions, I must install the Zoom program. I can enter the rooms either by clicking the web link or by clicking the Join a Meeting button in the Zoom program and typing the provided numbers. I enjoyed the environment during the conference. Moreover, I could discuss with people who are more expert in the field of antenna engineering. Many new experiences and knowledge are obtained during this conference. I met people with different research fields and discussed with people from different educational and cultural backgrounds.





I am very grateful to Prof. Dr.-Ing. Dirk Heberling for giving me the opportunity to do the internship at IHF, as well as Wasim Alshrafi M.Sc and Asst. Prof. Dr.-Ing. Suramate Chalermwisutkul for the guidance and supervision of my project. Also, thanks to the *Verein zur Förderung der Hochfrequenztechnik in Aachen e. V* for the financial support in the ICECCE 2020 registration.

