Executive Comment

Satellite Utilization for Communications & Sensing is an Attractive Research Subject

Mitsuo TATEIBA
Professor
Graduate School of Information Science and Electrical Engineering
Kyushu University

Biography

Dr. Tateiba is the Professor at Division of Electromagnetic Waves and Communications, in Graduate School of Information Science and Electrical Engineering, Kyushu Univ. since 1995. He received BS and MS degrees in Electronics in 1967 and 1969, respectively, and joined Kyushu Univ. as Research Associate in 1969. After receiving Dr. degree in Communication Engineering from Kyushu Univ., he joined Nagasaki Univ. and then Kyushu Univ. as Associate Prof., and became Full Prof. at Kyushu Univ. in 1990. He also joined the Univ. of Washington as Visiting Prof. in 1994. Prof. Tateiba is engaged in the research of satellite communications and electromagnetic wave sensing. He is the member of IEICE, IOP, IEEE and many other institutes.
For detail, refer: http://www-emlabo.csce.kyushu-u.ac.jp/~tateiba/english/index.html

Human beings have been bearing the interest in space; in particular, many young people are attracted in space, have dream in space and act towards realization of their dream. As the expression of that

fact, the School of Aeronautics & Space Engineering of universities has continuously been attractive for students. If some science and technology area can continuously give dream to young students, that area will never decline and will produce excellent young scholars. This fact can be better recognized if we compare the situation at space engineering with that of ship engineering. (I, however, believe marine engineering should have potential attractiveness enough to create the dream, since 70 % of the Earth is covered by the sea, and most of the undersea area is still unknown to us.)

Artificial satellites are the one important element to give shape to our dream for space. The launch of communications satellites, earth observation satellites, deep space probes and so on is supported by aeronautical engineering. However, needless to say, information / communication engineering and electromagnetic wave engineering are essential to make full use of the mission objectives of those satellites and probes Therefore, in my laboratory which is engaged in the research of satellite communications and electromagnetic wave sensing, there are several students every year who have desire to work in the space related area, based on the longing for space.

Research of satellite communications in my laboratory has rather new with about ten years history. We sometimes encounter the question asking the reason of researching satellite communications at university laboratory, despite the fact that it has already been firmly evaluated and widely utilized in the society. The answer to this question is related to the circumstances of, and motivation for the research of satellite communications.

From the viewpoint of utilization, satellite communications is not fully explored, and its outstanding characteristics have not necessarily been utilized effectively. Necessity of technology developments is readily proposed by the specialists for mobile/personal communications between ships, aircrafts, cars and people, for GIS, and for communications network connected with the terrestrial fiber communications. Furthermore, the importance of satellite communications is pointed out for resolving digital divide, for disaster communications, and for communications to under-developed countries.

In addition to the above points, satellite communications should be extensively considered from the users' standpoint. That is because many people well know the application which is feasible only by satellite communications, and have desire to utilize them, where possible. A driving force to make satellite communications be utilized from anywhere, easily and cheaply, can be generated through the collaboration of users (or potential users) in various areas with engineers. This certainly is one attractive point of satellite communications research.

Further, with some amount of investment, communications experiment utilizing real satellites can be done rather easily. This is helpful for the education of students. In the under-developed countries, satellite communications are the important means of not only domestic but also international

communication. The doctor program on satellite communications for foreign students can also contribute to fostering senior communications engineers in that country.

Satellite remote sensing and exploration are the well-known applications, and nobody opposes to the necessity of them. Furthermore, earth observation and planet exploration attract young people. The research of satellite observation and deep-space exploration will certainly be promoted continuously, even if it may sometimes undergo the examination of budget amount. Since we can find lots of subjects in the research field of satellite observation and sounding, which are widely ranging from science to practical use, this field is very attractive for the university researchers. We can freely choose the area of contribution in the wide range of research objectives. The choice should be a privilege given to the people in the university.

Utilizing this privilege and the accumulated research efforts in the past, various kinds of research, from observation of ocean waves by satellite altimeters to some basic subjects related to electromagnetic wave sensing, are being done in my laboratory. Targets for research are obviously the proposal of new concept, new theory, new calculation method and new measurement method, aiming the technology which didn't exist in the past, or largely surpasses the past technology. The research in the sensing area is somewhat premature compared to communications area. Exchange of research efforts between specialists in different organizations should be important for the progress of the research. In case the research subject is some fundamental, it will relate to various other fields; therefore, the result may be useful to different areas such as material science.

When we consider satellite utilization, it usually takes some time from planning phase to implementation phase. Therefore, good foresight for the technology is required so that the original plan might not become out-dated at the implementation phase. At the same time, we can use the transition time from the plan to implementation. Attractive points and approaches for research of satellite utilization have been addressed here through my personal experiences. In my view, the necessity of foresight and the use of the time described above would keep the role to sustain the research activity of satellite utilization through producing adequate tenseness and various different approaches for research.

As mentioned above, I have been kept such a good situation that both studies of communications and sensing have been carried out in my small laboratory; moreover, several research subjects for both have been freely chosen and pursued. I believe that it depends on the research environment peculiar to the university, in addition to the research situation for satellite utilization. I hope that the SPACE JAPAN REVIEW readers would well recognize that such free research environment is essential for the university to generate excellent research results to be valuable for the society. I also appreciate the support by many people to maintain and further develop the free environment in the university.

Finally, I look forward to the situation that satellite would be utilized more extensively, so that it could further contribute for the progress of human beings.