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Concluding Remarks

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Since establishment of the Kashima Branch of the Radio Research Laboratory in 1964, the former organization name of the present Kashima Space Research Center of the Communications Research Laboratory, research activity in this center has been focused on the two major fields of satellite communications and radio astronomy/geodesy. This special issue summarizes recent achievement obtained in the latter research field, which was generated with two large-sized antennas located in the Kashima Center: a 26-m diameter antenna, presently operated by the Geographical Survey Institute, and a 34-m diameter antenna.

The purpose of this special issue is to summarize the research accomplishment so far generated in this field and thereby to open new horizon of research in the 21st century. A remarkable feature in this research activity is the interdisciplinary aspect, which crosses over two different discipline of radio astronomy and geodesy. The VLBI has been a core technology in this activity, and the group in the center has been the world's top runner in its technical development. In actual scientific and geodetic applications, research has been conducted in close collaboration with other institutions such as the National Astronomical Observatory, the Geographical Survey Institute, and various universities. From these aspects, it is considered that this research group has a quite unique feature not only in Japanese research community but also in international community.

Based on the experience in technical development for many years in the past, ongoing technical development items are the real time VLBI data transmission with internet protocol (IP) on high-speed networks and gigabit VLBI technology in which more than one-Gbps sampling speed has been attained recently. Efforts are also being made for contribution to the international standardization of VLBI data.

As a plan for research from now on, "Development of basic technologies for building space-time standards in space" has been proposed, which includes various technology development including accurate satellite positioning applicable to deep space and real time earth attitude measurement as major research items. The various research outcomes discussed in this issue will undoubtedly be the foundations for the studies planned. I hope that this issue contributes to overview the research and development activities made so far, and helps to find a way for the studies in the new century.

I would like to express my sincere gratitude to everyone who has guided and supported our efforts over the years, and to all the institutions that have worked in collaboration with us. Finally, I would like to thank everyone who has been involved in the installation, operation, and maintenance of the large antennas for his continuous effort and enthusiasm.