V116a The Next Generation Very Large Array - Spring 2024

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We present recent progresses of the Next Generation Very Large Array (ngVLA) project. The ngVLA will be operated at frequencies from 1.2 to 116 GHz and consist of three arrays: the Main Array (214 × 18-m antennas with baselines up to 1000 km), the Short Baseline Array (19 × 6-m antennas and 4 × 18-m single dish), and the Long Baseline Array (30 × 18-m antennas with the longest baseline of 8860 km). The ngVLA will achieve 10× higher sensitivity and > 10× higher resolution than the VLA and ALMA, which will revolutionize our understandings on various aspects of the universe. In collaboration with NRAO, NAOJ ngVLA Study Group and the Science Working Group consisting of community members are developing unique science cases and key technical contributions of Japan. In this presentation, the new structure of the Study Group will be overviewed, and the recent progress on antennas, receivers, and photonics, which are the main technical contributions of Japan, will be reported. For example, laboratory experiments on the photonics (frequency reference transfer system) have successfully demonstrated stable signal distribution over long distances totaling 400 km. In addition, as a major movement on the US side after Astro2020, ngVLA has entered the NSF's Major Research Equipment & Facilities Construction (MREFC) review process this year. Given these circumstances, we will discuss a refined timeline of our Japanese contribution plan to this project.