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Challenges and breakthroughs in recent RF Solid State PA design by Radial Combiner design with Initiatives for SDGs

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R&K, an independent company, has achieved production of 2.3 million 1.9GHz microwave power amplifiers for mobile-comm's-base-stations and then also supplies wideband power amplifiers for automobile EMC testing for domestic automobile industries. Then 16 years ago, we started new design and producing some hundreds kW RF SSA for accelerator applications instead of Klystron / tube alternatives.

The measure characteristics of this amplifier is possible to design a band in a very wide frequency range available from few MHz to 14 GHz, and there is also max-power-changing capability in few kW to few MW design available even after system completed. Recently, SSA has gained significant advantages over vacuum tubes in terms of size, low power consumption, high efficiency, low cost, and adaptive power design. In addition to these, we have found that SSA has very low phase noise and low envelope noise that cannot be achieved with vacuum tubes.

All these points suggest a strong trend toward solid-state amplifiers and a move away from vacuum tube systems, even for power amplifiers used in particle accelerators. There is no doubt that all these improved performances will eventually lead to a strong trend towards his SDGs.

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Primary author: Mr KOBANA, Riichiro (R&K Company Limited)

Presenter: Mr KOBANA, Riichiro (R&K Company Limited)

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