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***"Exploring the potential of MIMO technology for next-generation wireless communication"***

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## **Abstract:**

Massive Multiple Input Multiple Output (MIMO) technology represents an evolution of traditional MIMO, distinguished by base stations (BSs) equipped with a large number of antennas, typically numbering in the hundreds or more. This abundance of antennas offers numerous advantages for wireless communication, particularly in managing escalating data volumes. Each antenna can concurrently serve multiple users, resulting in decreased power consumption and enhanced data rates. Moreover, the utilization of narrow, precisely targeted beams directed at individual user devices positioned at the cell periphery elevates downlink signal quality. Serving as an extension of conventional MIMO technology, massive MIMO presents a promising avenue for enhancing throughput rates and energy efficiency while significantly bolstering link reliability and data transmission rates. This technology represents a pivotal focus area in the realm of 5G wireless communication. Massive MIMO has undergone rapid development over the past three years, driven by advancements such as augmenting the number of communication antennas and employing advanced duplex communication modes, thus propelling system spectrum efficiency to unprecedented levels.

## **Keywords:**

Massive MIMO, Base stations, 5G, MIMO-NOMA,