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## Findings

The number of users is increasing. So, the technology is moving from 1G to 4G and now towards 5G. As the high data rate is needed the user demand can be fulfilled by the fifth generation(5G) because it provides a high data rate along with low latency. As users are preferring wireless communication. An antenna is main part that converts Electrical signals(V, I) into electromagnetic waves(E, H). Antennas are of various types like yagi -uda antenna, log periodic antenna, spiral antenna, etc. But the microstrip patch antenna has drawn the attraction due to the extraordinary properties like compact size, lightweight, and ease of fabrication. Microstrip patch antennas are the revolutionary antennas . So, the interest in designing microstrip patch antennae for 5G applications is a good research area for antenna designers.

Fifth-generation antennas are attractive to design because of various benefits like high data rate and low latency but one major drawback of atmospheric absorption at high frequency is a concern for antenna designers so at the time of designing an antenna the various factors should be noted like antenna should be designed with the high gain characteristics. Other factors like high bandwidth for high data rate and multi-resonant antenna for multiapplication and the circular polarization properties, good return loss characteristics, etc. should be achieved. So in my thesis work various antennas with high gain large bandwidth and multi-resonating characteristics has been designed for 5G mm-wave applications.