In general, the throughput of all schemes decreases as the distance between AP and station becoming larger. Schemes with no multi-path fading perform better than schemes with multi-path fading effect.

Comparing the throughput performance of AARF and CARA with fading, it is interesting that that they both have same throughput in 30m. The reason is that due to the distance is too close, so that both schemes do not have enough consecutive fail transmission to reach the threshold, so they transmit data in same rate. But after 30m, AARF has a better outcome, it is because that AARF uses adaptive threshold updates, which will increase the high-speed time and fewer rate fluctuation than AFR [1]. At this situation, CARA acts the same with ARF (because there is no collision), so AARF is better than CARA.

In term of throughput with fading, both schemes have quite the same performance, but it is obvious to see that AARF is better before 50m, the reason has been mentioned above.

Reference:

1. M. Lacage, M. H. Manshaei and T. Turletti, “ IEEE 802.11 Rate Adaptation: A Practical

Approach ,” in Proc. 7th ACM International Symposium on Modeling, Analysis and

Simulation of Wireless and Mobile Systems (MSWiM '04), 2004.