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 no fading, it is interesting that that they both have same throughput within 25m. The reason is that the distance is too close, so that both schemes do not have enough consecutive fail transmission to reach the threshold, transmission is successful, 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. But when the distance goes much higher, the error rate becomes higher, so the performance gap between AARF and CARA becomes small.

In term of throughput with fading, it is easy to see that the multi-path fading causes approximate 8Mbps throughput decrement to both schemes. And due to the fading, both schemes encounter transmission fail and alter transmission rate from the beginning, they have quite the same performance, but it is also obvious to see that AARF is better than CARA a bit. The reason of that has discussed in last paragraph.

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.