The rest of this paper is organized as follows. Section II briefly introduces our TXOP delegation method for the uplink and show how it works. In Sect. III, we describe out TXOP delegation method for the downlink in detail. In Sect. IV, we observe how our method works through computer simulations and verify that it enables an STA to delegate throughput to another STA, while the other STAs see the same throughput as before. We also discuss the performance with varying the number of other STAs and round trip time (RTT). Finally, we mention the related work and conclude our paper in Sect. V and VI.

II. PREVIOUS WORK: TXOP EXCHANGE FOR UPLINK

CSMA/CA, which is deployed in WLANs, was originally designed for assigning TXOPs equally to the STAs when the traffic load is heavy. An STA is able to send a data frame when it obtains a TXOP. In WLANs, to the best of our knowledge, there has been no method that enables an STA to delegate its TXOPs to another STA without modification to APs. Therefore, we newly designed a TXOP delegation method in WLAN in [1]. The proposed method requires small modification to the conventional IEEE