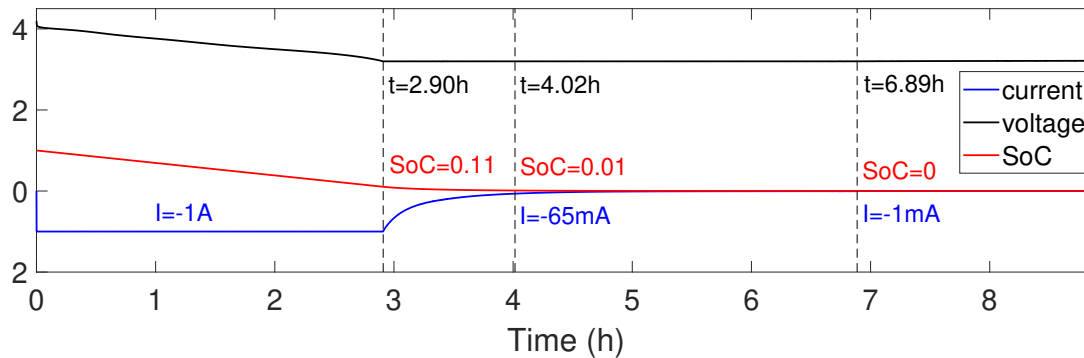


(a) CC-CV charge.



(b) CC-CV discharge.

Figure 1: CC-CV charge and discharge.

The note is about constant-current/constant-voltage (CC-CV) experiments on a Panasonic NCR18650B lithium-ion battery. The battery has a rated capacity of 3.4 Ah, and the operating voltage is set between 3.2 V and 4.2 V. The experiment is a CC-CV charge followed by a CC-CV discharge as depicted in Figure 1:

- Charge: CC under 1.625 A till voltage hits 4.2 V, then CV till current reduces to 1 mA.
- Rest: Around 4 h.
- Discharge: CC under 1 A till voltage hits 3.2 V, then CV till current reduces to 1 mA.

Remark 1 Before the CC-CV charge, the battery is depleted under CC-CV discharge till current reduces to 5 mA (not shown in Figure 1). For this reason, we consider $SoC=0$ at the start of the CC-CV charge (see Figure 1(a)). Besides, the capacities obtained from the CC-CV charge and discharge are different, which are 3.26 Ah and 3.25 Ah, respectively. Despite of this, SoC for charge and discharge is normalized based on its respective capacity for the sake of simplicity.

Remark 2 For the CC-CV charge, the battery is considered being fully charged when current reduces to 65 mA according to the manufacturer's specifications. From Figure 1(a) we can see the cut-off current of 65 mA is indeed a reasonable choice compared with that of 1 mA.