

**Supporting Information for ‘Dynamic Impact Response of Lithium-Ion Batteries,  
Constitutive Properties and Failure Model’**

Golriz Kermani <sup>a,c</sup>

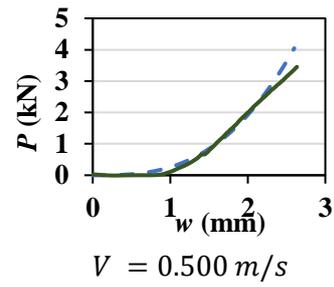
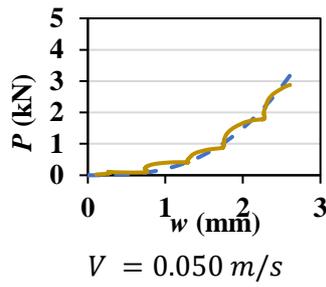
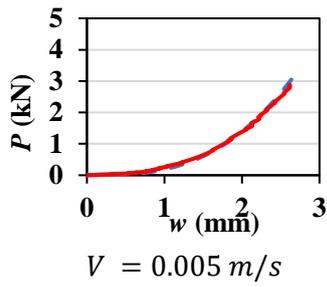
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### Pouch Cells



### Elliptical Cells

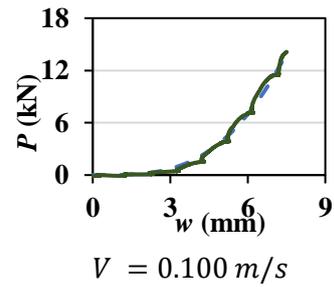
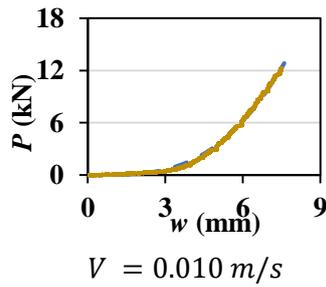
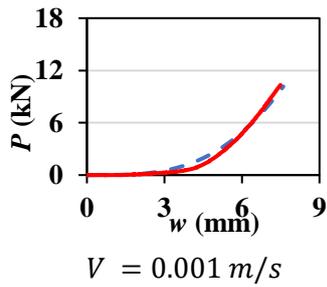


Figure S1- Analytical (dashed lines) vs. experimental (solid lines) load-displacement response of pouch cells (Top) and elliptical cells (Bottom) at different crosshead velocities

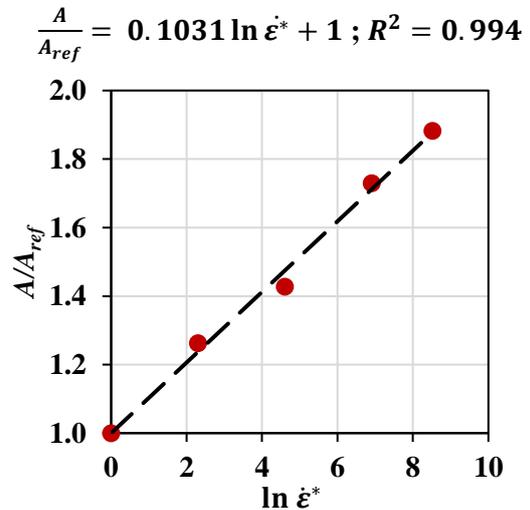
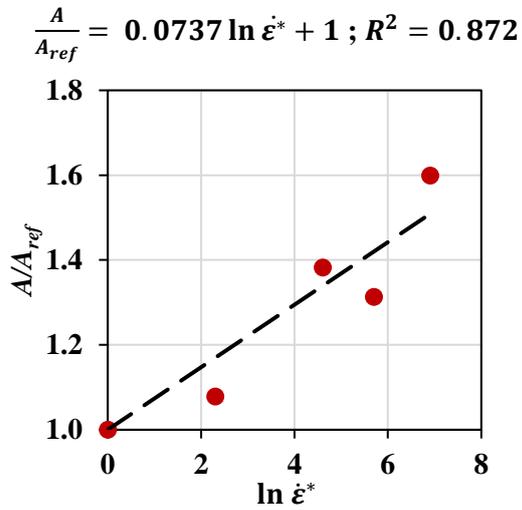
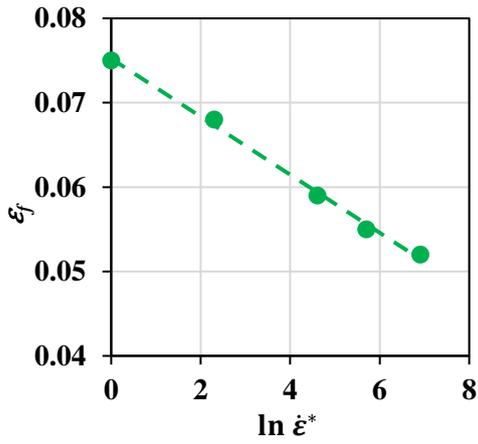


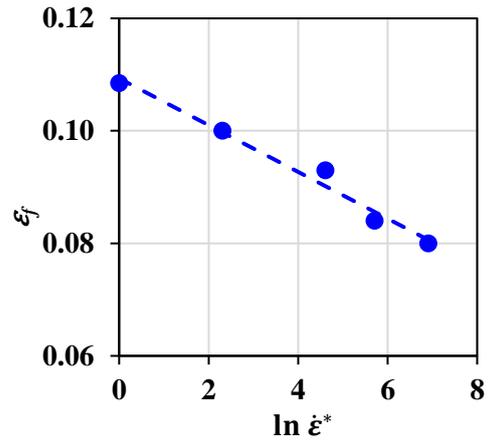
Figure S2. Linear relationship between the normalized fit coefficients ( $A/A_{ref}$ ) and  $\ln \dot{\epsilon}^*$  in a) pouch and b) elliptical cells.

$$\varepsilon_f = -0.003 \ln \dot{\varepsilon}^* + 0.075 ; R^2 = 0.996$$



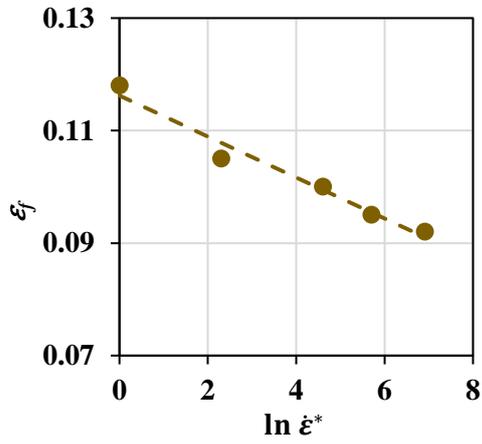
a) Pouch Cell, Mesh 1.2 mm

$$\varepsilon_f = -0.004 \ln \dot{\varepsilon}^* + 0.109 ; R^2 = 0.978$$



b) Pouch Cell, Mesh 2.0 mm

$$\varepsilon_f = -0.004 \ln \dot{\varepsilon}^* + 0.116 ; R^2 = 0.970$$



c) Pouch Cell, Mesh 4.0 mm

Figure S3. A negative linear relationship was found between  $\varepsilon_f$  and  $\ln \dot{\varepsilon}^*$  in pouch cells for all mesh sizes studied (a, b, and c).