$Z_m(\mu = 2.500 \text{ GeV})$ $Z_m(am_q) = k_1 + k_2 am_q \log(am_q) + k_3 (am_q)^2$ **C**1 F1S 2.3 fit *p*-value:0.98 fit *p*-value:0.96 fit *p*-value:0.00 $---am_q^* (M_{\eta_c}^* = 2.4 \text{ GeV})$ $--am_q^* (M_{\eta_c}^* = 2.4 \text{ GeV})$ $--am_q^* (M_{\eta_c}^* = 2.4 \text{ GeV})$ 4.0 - $---am_q^* (M_{\eta_c}^* = 2.6 \text{ GeV})$ $---am_q^* (M_{\eta_c}^* = 2.6 \text{ GeV})$ $---am_q^* (M_{\eta_c}^* = 2.6 \text{ GeV})$ 3.5 -2.2 $am_q^* (M_{\eta_c}^* = PDG)$ $---am_q^*(M_{\eta_c}^*=PDG)$ $---am_q^* (M_{\eta_c}^* = PDG)$ ightharpoonup simulated am_q simulated am_q simulated am_q 3.5 -2.1 3.0 -2.0 -3.0 -1.9 -2.5 2.5 1.8 -2.0 2.0 -1.7 -1.6 -1.5 -1.5 -0.1

0.2

 am_q

0.3

0.4

0.1

0.0

0.2

0.3

0.4

0.5

0.0

0.2

 am_q

0.1

0.0

0.3

0.4