Figure 3: Continuation for increasing $g_{SI}$ of solutions to system (5)–(8); panel (a) shows the $\text{Auto } L^2$-norm of the solution branch versus $g_{SI}$ and illustrates that the spike-adding mechanism happens suddenly via a pronounced drop in norm; panels (b)–(f) show representative solutions along the branch, indicated by the correspondingly labelled dots in panel (a), and illustrate that solutions during a spike generation, i.e., panels (c) and (d), exhibit a stretched ADP that develops into a double step before relaxing back to the resting potential.

Figure 3(b) shows our starting solution, i.e., a single spike followed by ADP. Along this first plateau of the solution branch up to the first downward peak all orbit segments are qualitatively like Figure 3(b); in particular the ADP is a small hump. As we follow the solutions into the downward peak the hump of the ADP for the orbit segments stretches out as shown in Figure 3(c), which lies at the bottom of the downward peak. Interestingly, as we follow the solution back up along the downward peak, the orbit segment generates a double step in the ADP, as shown in Figure 3(d); we selected the orbit segment with the longest double step (with respect to

shown in Figures 3(b)–(f); note that we present the time series up to $t = 200 \text{ms}$ for clarity of the presentation.

Figure 3(b) shows our starting solution, i.e., a single spike followed by ADP. Along this first plateau of the solution branch up to the first downward peak all orbit segments are qualitatively like Figure 3(b); in particular the ADP is a small hump. As we follow the solutions into the downward peak the hump of the ADP for the orbit segments stretches out as shown in Figure 3(c), which lies at the bottom of the downward peak. Interestingly, as we follow the solution back up along the downward peak, the orbit segment generates a double step in the ADP, as shown in Figure 3(d); we selected the orbit segment with the longest double step (with respect to