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Pituitary cells of the anterior pituitary gland secrete hormones in response to patterns of electrical activity. Several types of pituitary cells produce short bursts of electrical activity which are more effective than single spikes in evoking hormone release. These bursts, called pseudo-plateau bursts, are unlike bursts studied mathematically in neurons (plateau bursting) and the standard fast-slow analysis used for plateau bursting is of limited use. Using an alternative fast-slow analysis, with one fast and two slow variables, we show that pseudo-plateau bursting is a canard-induced mixed mode oscillation. Using this technique, it is possible to determine the region of parameter space where bursting occurs as well as salient properties of the burst such as the number of spikes in the burst. The information gained from this one-fast/two-slow decomposition complements the information obtained from a two-fast/one-slow decomposition. (Received September 22, 2011)