1086-34-2360 **Bruno D. Welfert*** (welfert@asu.edu), School of Math. & Stat. Sciences, Arizona State University, Tempe, AZ 85287, and **Juan M. Lopez** (jmlopez@asu.edu), School of Math. & Stat. Sciences, Arizona State University, Tempe, AZ 85283. *Slow passage through resonance: the big picture.* Preliminary report.

We consider the response of the model oscillator problem

$$\ddot{x} + \gamma\dot{x} + x = \sin\left(\frac{1}{\epsilon}f(\epsilon t)\right),$$

where $\epsilon \ll 1$ is a small parameter and f is a general function. For example, the choice $f(\tau) = (\omega_0 + \tau)\tau$ corresponds to a slowly drifting frequency, for which it has recently been shown that x exhibits a dynamic behavior which differs from the constant frequency case, in particular an early resonance at a frequency depending on ω_0.

We show that the right-hand side in the above model can be very well approximated, in the limit $\epsilon \to 0$, by the superposition of on-off switches (modeled by Heaviside terms) at critical times characterized by $|f'(\epsilon t_c)| = 1$, and whose amplitude depends on the curvature $|f''(\epsilon t_c)|$.

Various choices of forcing functions f are used to illustrate the result, and extensions to stochastic forcing functions f are discussed. (Received September 25, 2012)