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Xinfu Chen (xinfu@pitt.edu), 301 Thackeray Hall, Pittsburgh, PA 15260, and **Susmita Sadhu*** (sus38@pitt.edu), 301 Thackeray Hall, Pittsburgh, PA 15260. *Asymptotic Expansions Of Solutions Of An Inhomogeneous Equation.*

I will discuss a joint work with X. Chen on asymptotic behavior of solutions of

$$\varepsilon^2 u''(x) = u(x)(q(x) - u(x)), \quad \text{for } x \in [-1, 1],$$

where $\varepsilon > 0$ is a small parameter and q is a smooth, bounded function with minimum greater than or equal to 2. Under the boundary conditions $u(-1) = \alpha_-$, $u(1) = \alpha_+$, I will briefly derive asymptotic expansions of solutions that may have up to 3 critical points. The well known Carrier's equation

$$\varepsilon^2 y'' + 2(1 - x^2)y + y^2 = 1, \quad y(-1) = y(1) = 0$$

can be reduced to this form. If time permits, I will present some solutions of this boundary value problem and show that the conjectured formal asymptotics are correct up to $O(\varepsilon)$. (Received September 22, 2010)