1056-34-995 **gaston m n'guerekata*** (`Gaston.N'Guerekata@morgan.edu`), 1700 East Cold Spring Lane, Baltimore, MD 21251. *Circular spectrum and bounded solutions of periodic evolution equations in Banach spaces.*

We study the existence and uniqueness of bounded solutions of periodic evolution equations of the form $u' = A(t)u + \epsilon H(t,u) + f(t)$ in a Banach space X where $A(t)$ is, in general, an unbounded operator depending 1-periodically in t, H is 1-periodic in t, ϵ is small, and f is a bounded continuous function. We propose a new approach to the spectral theory of functions via the concept of "circular spectrum" and then apply it to study the linear equation $u' = A(t)u + f(t)$ with general conditions on f. For small ϵ, we show that the perturbed equation inherits some properties of the unperturbed one. The main resulst extend recent results in the direction, saying that if the unitary spectrum of the monodromy operator does not intersect the circular spectrum of f, then the evolution equation has a unique mild solution with its spectrum contained in the circular spectrum of f (Received September 19, 2009)