Abstract: The popularity of current-mode control has made it the method of choice for most power supplies ever since it was first introduced in the late 1970s. Usually, current-mode control methods are divided into two main categories: 1) fixed-frequency methods and 2) variable frequency methods. Different types of fixed-frequency methods have been introduced including: peak current-mode control (PCMC), average current mode control (ACMC), valley control, charge control and etc. Among all of these methods PCMC and ACMC are more popular.

Projected cross point control (PCPC) is a newly proposed fixed-frequency current mode control scheme. PCPC combines the benefits of both fixed-frequency and variable frequency current mode controllers.

In this seminar, the concept of a new improved projected cross point control (PCPC) as a new current mode control is introduced and is investigated through a large signal and small signal analysis. This control method presents several advantages over other well known current control methods such as peak current mode control (PCMC) and average current mode control (ACMC). It will be shown while PCPC is a fixed-frequency method it is stable for the entire range of duty cycle similar to the variable frequency hysteresis current mode control. Other advantages of this new method will be discussed by comparing this method with well known peak current mode control and average current mode.

To get a deep insight of the individual features of this new control method a small signal model is derived for this control method. Then different small signal transfer functions for this method will be obtained using the derived small signal model. To prove the significant superiority of the new improved PCPC controllers, the small signal properties of this method will be compared with the small signal models of PCMC and ACMC.

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