Re: Cuk converter bizzare control loop

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"robert lafrance" wrote:

>Right off the bat I will tell you this is homework − sorta. I got the thing
>running pretty much ok. Used the old virtual decade box and it looks about
>right. Now I just have to go back and analytically justify the loop that
>works. Was supposed to finish this last problem in Mathcad, but Switchercad
>works so nice.
>
>With the thing running I see when I jerk the bus up and down the converter
>kinda does opposite what I would expect. When I step it up to 550v from
>450v the output actually goes down before catching itself and stabalizing.
>I expect this is probably a characteristic of the species. This version
>just uses output inductor in series with 10 ohm load. The problem is to get
>it stable at 60Hz out. I'm just running along at DC out to satisfy my own
>curiousity.
>
>Would like to hear a comment on the control loop from someone who has played
>with this animal.
>

Look up "right half plane zero". As you suspect it is a "feature* of the species. It ocurrs in continuous mode mode only. Run it in discontinuous mode (complete energy transfer) and the problem will go away. Despite what you might read in some texts there's piss all you can do about it other than to swamp it by drastically reducing the bandwidth of the loop. This can be proved mathematically.

Best analogy I ever heard for a right half plane zero was on this NG. Think about turning a bicycle.

Loads of people will argue with this. I don't care, they're wrong. I'm off to the airport to fly to USA.

Gibbo