DC Microgrid Resonance

How do you describe a dc microgrid?
The differential equations describing the system are thus obtained. So,the DC microgrid is described by the following state-space equation (19) x = A ? x +B ? u,where x is the vector of the system state variables,u is the vector of the system inputs,A is the system matrix,and B is the input matrix.

Does negative incremental resistive effect affect dc microgrid stability?
The negative incremental resistive effect of such CPLs reduces the damping of the DC microgrid and may lead to instability. Therefore,stability analysis and stabilization of DC microgrids have become subject of intensive research ,,,,,,,,.

How can a dc microgrid model be useful?
To obtain a model of general validity and practical value,the behavioral characteristics of all components connected to DC microgrid buses are mapped onto two elementary categories. With the DC microgrid model then obtained in nonlinear state-space format and subsequent linearization,a sufficient criterion of stabilityis readily obtained.

What drives the interest in DC microgrids?
1. Introduction The integration of renewable energy sources, the emergence of more DC loads, the features of high power efficiency, absence of synchronization issues, and absence of reactive power compensation are driving the interest in DC microgrids , .

Can a dc microgrid stabilizer be tuned?
With the DC microgrid model then obtained in nonlinear state-space format and subsequent linearization,a sufficient criterion of stability is readily obtained. It gives the rule for tuning the DC microgrid stabilizer. The simulation tests confirmed the validity of the modeling and analysis framework as well as the performance of the stabilizer. 1.

What is a virtual positive resistance in a dc microgrid?
A virtual positive resistance is created to counteract effects of a negative small-signal resistance due to a constant power load. Altogether,the proposed concept of modeling and analysis as well as the development of the DC microgrid stabilizer enable the secure operation of DC microgrids.

A bidirectional DC/DC converter is presented to have low switching loss on active devices, forward/backward power operation, and wide voltage operation for battery charge/discharge applications on a DC microgrid ...

This paper proposes a new DC-DC bipolar resonance converter that combines a dual-active-bridge and a multi-port resonance Buck-Boost converter. This structure uses a ...

This paper presents the small-signal stability performance of a dc microgrid (MG) and investigates the interactions between the converter controllers by studying the critical modes.

Series DC electric springs (DCESs) are a state-of-the-art demand-side management (DSM) technology with the capability to reduce energy storage requirements of DC microgrids by ...

If a disturbance occurs, it usually deteriorates both controller performance and supply voltage quality at DC bus in microgrids. This issue, however, has not been fully ...

required in electric vehicles and DC microgrids. A non-isolated bidirectional converter for hybrid energy system applications is proposed in [16] which connect PV and battery to load or DC ...

In the DC microgrid, constant power loads (CPL) experience negative damping characteristics. This phenomenon often leads to resonance during the cascading process, thereby affecting ...

The passive damping method analyzed in this paper is applied to an installed power converter, where it is possible to ensure the stability of the DC microgrid. Discover the world"s research 25 ...

To solve the issue, this paper proposes a stability detection strategy for DC microgrid systems with passive damping, using the extreme gradient boosting (XGboost) method. Firstly, passive ...