Ground resonance of photovoltaic inverter

What is the resonance mechanism of photovoltaic grid-connected system?
The resonance mechanism of photovoltaic grid-connected system is analyzed based on frequency domain analysis method. The notch filter is added into the active damping control method,and the active damping of the system is enhanced by using the notch characteristics.

Why does a PV inverter have a series parallel resonance?
When the PV inverter is connected to the grid, series-parallel resonance may occur due to the dynamic interaction between multiple inverters operating in parallel and between the PV inverter and the grid impedance. Consequently, this leads to changes in the output voltage harmonic characteristics of the PV plant.

What is 'harmonic resonance' in grid-connected inverters?
On the basis of the traditional concept of 'circuit resonance,' the resonance in grid-connected inverters has been analyzed [25,26]. However,the circuit resonance is not very helpful for analyzing system stability or harmonic amplification. In this paper,a new resonance conceptis proposed which is called 'harmonic resonance.'

Why do inverter-grid systems have a resonance phenomenon?
In inverter-grid systems,some studies have pointed out that a resonance phenomenon can arise when the inverter output impedance matches the grid impedance,due to various grid impedances[20,21,22,23]. In addition,frequency-varying resonances were analyzed in . Consequently,the harmonics in the grid current can be inordinate.

How many resonance peaks are there in a photovoltaic grid-connected system?
1. There are usually two resonance peaksin photovoltaic grid-connected system,one of which is the natural resonance peak produced by LCL filter. The other is the coupling resonance peak formed by the parallel connection of multiple inverters and the impedance coupling of the power grid.

Is there an equivalent impedance model for a grid-connected inverter?
In this paper,an equivalent impedance model of a grid-connected inverter is establishedbased on the traditional dual-control-loop strategy. Then,two kinds of resonance are introduced,i.e.,circuit resonance based on zero resistance and harmonic resonance based on minimum impedance.

An important technique to address the issue of stability and reliability of PV systems is optimizing converters" control. Power converters" control is intricate and affects the ...

PV inverter system considering the PLL dynamics and ... resonance frequency, for the frequency range of interest, i.e., !<<2 fres, Cf does not in uence the inverter output current, and iinv = ig ...

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In this paper, in response to the problem of grid-connected resonance of the cluster inverter in a 200 MW large photovoltaic power station, a corresponding equivalent mathematical model was established based on the ...

PV inverters use semiconductor devices to transform the DC power into controlled AC power by using Pulse Width Modulation (PWM) switching. ... Resonance: When a harmonic current ?ow ...

Additionally, ZSI can reliably work with a wide range of DC input voltage generated from PV sources. So, ZSIs are widely implemented for distributed generation systems and electric ...

The circuit topology of the current source photovoltaic grid-connected inverter is shown in Fig. 1 [] the figure, u dc is the output voltage of the photovoltaic cell, L dc is the DC ...

With increasing penetration of renewable energy sources into distributed power systems, multi-parallel inverters are commonly employed in the interface to the utility grid, ...

Equation clearly shows that the harmonic impedance, and thus resonance phenomena, of the PV inverter system, is a complex function of the LCL filter components, grid impedance, PWM and current controller ...

even when individual PV inverter units have initially been commissioned to comply with the regulations. For this reason, the grid-connected PV inverter should ideally be designed to ...

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