

## عنوان مقاله:

Asymmetrical Modular Multilevel Converter (A-MMC) with Mixed Cell Sub-Modules (SM) for Improved DC Fault Blocking Capability and Reduced Component Count

## محل انتشار:

مجله مهندسی برق مجلسی، دوره 17، شماره 1 (سال: 1402)

تعداد صفحات اصل مقاله: 12

## نویسندگان:

himanshu chaudhari - Department of Electrical Engineering, SVNIT, Surat, India

Pranav Darji - Department of Electrical Engineering, SVNIT, Surat, India

## خلاصه مقاله:

In this article, asymmetrical modular multilevel converter (A-MMC) topology using mixed cell (SM) with DC-side fault blocking capability and the reduced component count is proposed. The mixed cell submodule is made up of a full-bridge (FB-SM) and a half-bridge (HB-SM) with asymmetric capacitor voltage based on geometric propagation (GP) ratio. Each mixed cell submodule can generate a maximum of four output voltage levels with binary GP ratio and five output voltage levels with ternary GP ratio using six controlled switches and two asymmetric capacitors. The proposed A-MMC topology requires nearly half the number of components and voltage sensors compared to conventional topologies. This will result in simpler control structure of A-MMC with DC fault blocking capability. A voltage balancing algorithm based on normalization is used for capacitor voltage balancing and a hybrid pulse width modulation (H-PWM) technique to generate gating signals. Detailed operational concepts of the proposed topology, the pre-charging process of a capacitor, and performance with different modulation indexes are discussed in length. A detailed simulation model of A-MMC under different operating conditions is carried out using MATLAB/SIMULINK environment. To show the benefits of mixed cell SM, a comparison between the proposed mixed cell and other existing cells is presented in detail. The simulation results analysis show effectiveness of proposed schemes over other schemes presented in literature.

## کلمات کلیدی:

Asymmetrical Modular Multilevel Converter (A-MMC), HVDC system, Mixed Cell, Hybrid modulation technique, Reduced Component Count, DC Fault Blocking Capability

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1714995>

