Perforated Domains Close to the Critical Exponent

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Abstract: We give a general Γ-convergence result for vector-valued nonlinear energies defined on perforated domains for integrands with p-growth in the critical case $p = n$. We characterize the limit extra term by a formula of homogenization type. We also prove that for p close to n there are three regimes, two with a non trivial size of the perforation (exponential and mixed polynomial-exponential), and one where the Γ-limit is always trivial.