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Search for high-mass Zγ resonances in proton–proton collisions at s=8 and 13 TeV using jet substructure techniques (Article) (Open Access)

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Abstract

A search for massive resonances decaying to a Z boson and a photon is performed in events with a hadronically decaying Z boson candidate, separately in light-quark and b quark decay modes, identified using jet substructure and advanced b tagging techniques. Results are based on samples of proton–proton collisions collected with the CMS detector at the LHC at center-of-mass energies of 8 and 13TeV, corresponding to integrated luminosities of 19.7 and 2.7 fb^{-1}, respectively. The results of the search are combined with those of a similar search in the leptonic decay modes of the Z boson, based on the same data sets. Spin-0 resonances with various widths and with masses in a range between 0.2 and 3.0TeV are considered. No significant excess is observed either in the individual analyses or the combination. The results are presented in terms of upper limits on the production cross section of such resonances and constitute the most stringent limits to date for a wide range of masses.

Author keywords

CMS EXO Physics Resonances

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	Joint Institute for Nuclear Research	JINR	See opportunities by JINR
	Pakistan Atomic Energy Commission	PAEC	See opportunities by PAEC
C-1845	Welch Foundation		See opportunities
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	Ministry of Science and Technology	MOST	See opportunities by MOST
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	Hispanics in Philanthropy	HIP	See opportunities by HIP
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	University of Minnesota	UM	See opportunities by UM↗
	Rochester Academy of Science	RAS	See opportunities by RAS↗
	State Atomic Energy Corporation ROSATOM	ROSATOM	See opportunities by ROSATOM↗
	Agentschap voor Innovatie door Wetenschap en Technologie	IWT	See opportunities by IWT↗

Funding number	Funding sponsor	Acronym	Funding opportunities
	Chulalongkorn University	CU	See opportunities by CU↗
	European Regional Development Fund	ERDF	See opportunities by ERDF↗
	Ministerstvo Školství, Mládeže a Tělovýchovy	MŠMT	See opportunities by MŠMT↗
	General Secretariat for Research and Technology	GSRT	See opportunities by GSRT↗
	European Research Council	ERC	See opportunities by ERC↗

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