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Experimental test of the spectral analogue of the law of the wall in rough-pipe flows CARLO ZUNIGA ZAMALLOA, GUSTAVO GIOIA, PINAKI CHAKRABORTY, Okinawa Institute of Science and Technology — We extend the recently proposed spectral analogue of Prandtl's law of the wall to obtain a scaling relation for the turbulent energy spectra in rough-pipe flows. To test this scaling relation we measure the streamwise component of the turbulent energy spectrum on numerous locations along the radii of three rough-walled pipes, for flows spanning a decade in Reynolds number. Our results are in excellent accord with the scaling relation.

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