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X-RAYING HADRONIC ACCELERATION AT THE SN 1006 SHOCK FRONT

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Shock fronts in young supernova remnants are the best candidates for being sites of cosmic rays acceleration up to a few PeV, though conclusive experimental evidence is still lacking. Theoretical models predict that particle acceleration can modify the post-shock properties, e. g. by increasing the plasma density. We exploited the Large Program of deep XMM-Newton observations of SN 1006 to verify this prediction. We focused on the rim of the supernova remnant and by performing spatially resolved spectral analysis, we found that the shock compression ratio significantly increases in regions where particle acceleration is efficient, in agreement with expectations. Our results provide observational evidence for the presence of hadron acceleration processes at the SN 1006 shock front.