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Authors	H. E. S. S. Collaboration, Abdalla, H., Abramowski, A., Aharonian, F., Ait Benkhali, F., Akhperjanian, A. G., Andersson, T., Anguner, E. O., Arrieta, M., Aubert, P., Backes, M., Balzer, A., Barnard, M., Becherini, Y., Becker Tjus, J., Berge, D., Bernhard, S., Bernlohr, K., Blackwell, R., Bottcher, M., Boisson, C., Bolmont, J., Bordas, P., Bregeon, J., Brun, F., Brun, P., Bryan, M., Bulik, T., Capasso, M., Carr, J., Casanova, S., Cerruti, M., Chakraborty, N., Chalme-Calvet, R., Chaves, R. C. G., Chen, A., Chevalier, J., Chretien, M., Colafrancesco, S., Cologna, G., Condon, B., Conrad, J., Cui, Y., Davids, I. D., Decock, J., Degrange, B., Deil, C., Devin, J., Dewilt, P., Dirson, L., Djannati-Ata, A., Domainko, W., Donath, A., Drury, L. O'c., Dubus, G., Dutson, K., Dyks, J., Edwards, T., Egberts, K., Eger, P., Ernenwein, J. -P., Eschbach, S., Farnier, C., Fegan, S., Fernandes, M. V., Fiasson, A., Fontaine, G., Forster, A., Fukuyama, T., Funk, S., Fussling, M., Gabici, S., Gajdus, M., Gallant, Y. A., Garrigoux, T., Giavitto, G., Giebels, B., Glicenstein, J. F., Gottschall, D., Goyal, A., Grondin, M. -H., Hadasch, D., Hahn, J., Haupt, M., Hawkes, J., Heinzlmann, G., Henri, G., Hermann, G., Hervet, O., Hinton, J. A., Hofmann, W., Hoischen, C., Holler, M., Horns, D., Ivascenko, A., Jacholkowska, A., Jamroz, M., Janiak, M., Jankowsky, D., Jankowsky, F., Jingo, M., Jogler, T., Jouvin, L., Jung-Richardt, I., Kastendieck, M. A., Katarzynski, K., Katz, U., Kerszberg, D., Khelifi, B., Kieffer, M., King, J., Klepser, S., Kloczkov, D., Kluzniak, W., Kolitzus, D., Komin, Nu., Kosack, K., Krakau, S., Kraus, M., Krayzel, F., Kruger, P. P., Laffon, H., Lamanna, G., Lau, J., Lees, J. -P., Lefaucheur, J., Lefranc, V., Lemiére, A., Lemoine-Goumard, M., Lenain, J. -P., Leser, E., Lohse, T., Lorentz, M., Liu, R., Lopez-Coto, R., Lypova, I., Marandon, V., Marcowith, A., Mariaud, C., Marx, R., Maurin, G., Maxted, N., Mayer, M., Meintjes, P. J., Meyer, M., Mitchell, A. M. W., Moderski, R., Mohamed, M., Mohrmann, L., Mora, K., Moulin, E., Murach, T., de Naurois, M., Niederwanger, F., Niemiec, J., Oakes, L., O'Brien, P., Odaka, H., O Ttl, S., Ohm, S., Ostrowski, M., Oya, I., Padovani, Marco, Panter, M., Parsons, R. D., Pekeur, N. W., Pelletier, G., Perennes, C., Petrucci, P. -O., Peyaud, B., Piel, Q., Pita, S., Poon, H., Prokhorov, D., Prokoph, H., Puhlhofer, G., Punch, M., Quirrenbach, A., Raab, S., Reimer, A., Reimer, O., Renaud, M., de Los Reyes, R., Rieger, F., Romoli, C., Rosier-Lees, S., Rowell, G., Rudak, B., Rulten, C. B., Sahakian, V., Salek, D., Sanchez, D. A., Santangelo, A., Sasaki, M., Schlickeiser, R., Schussler, F., Schulz, A., Schwanke, U., Schwemmer, S., Settimo, M., Seyffert, A. S., Shafi, N., Shilon, I., Simoni, R., Sol, H., Spanier, F., Spengler, G., Spies, F., Stawarz, L., Steenkamp, R., Stegmann, C., Stinzing, F., Stycz, K., Sushch, I., Takahashi, T., Tavernet, J. -P., Tavernier, T., Taylor, A. M., Terrier, R., Tibaldo, L., Tiziani, D., Tluczykont, M., Trichard, C., Tu, R., Uchiyama, Y., van der, Walt D. J., van Eldik, C., van Rensburg, C., van Soelen, B., Vasileiadis, G., Veh, J., Venter, C., Viana, A., Vincent, P., Vink,

H.E.S.S. observations of RX J1713.7-3946 with improved angular and spectral resolution: Evidence for gamma-ray emission extending beyond the X-ray emitting shell.

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Keywords: acceleration of particles - cosmic rays - ISM: supernova remnants - gamma rays: general - astroparticle physics

Abstract:
Supernova remnants exhibit shock fronts (shells) that can accelerate charged particles up to very high energies. In the past decade, measurements of a handful of shell-type supernova remnants in very high-energy gamma rays have provided unique insights into the acceleration process. Among those objects, RX J1713.7-3946 (also known as G347.3-0.5) has the largest surface brightness, allowing us in the past to perform the most comprehensive study of morphology and spatially resolved spectra of any such very high-energy gamma-ray source. Here we present extensive new H.E.S.S. measurements of RX J1713.7-3946, almost doubling the observation time compared to our previous publication. Combined with new improved analysis tools, the previous sensitivity is more than doubled. The H.E.S.S. angular resolution of 0.048° (0.036° above 2TeV) is unprecedented in gamma-ray astronomy and probes physical scales of 0.8 (0.6) parsec at the remnant's location. The new H.E.S.S. image of RX J1713.7-3946 allows us to reveal clear morphological differences between X-rays and gamma rays. In particular, for the outer edge of the brightest shell region, we find the first ever indication for particles in the process of leaving the acceleration shock region. By studying the broadband energy spectrum, we furthermore extract properties of the parent particle populations, providing new input to the discussion of the leptonic or hadronic nature of the gamma-ray emission mechanism.

Description:
FITS files with the very high-energy gamma-ray images, Fig.1, and the spectrum, Fig.3, as ascii text file.

Objects:

RA (2000)	DE	Designation(s)
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File Summary:

See also:

- [J/A+A/612/A1](#) : H.E.S.S. Galactic Plane Survey (HESS+, 2018)
- [J/A+A/612/A5](#) : W49B with H.E.S.S. and Fermi-LAT (HESS+, 2018)
- [J/A+A/612/A7](#) : Vela Junior (RX J0852.0-4622) HESS image (HESS+, 2018)

Byte-by-byte Description of file: [spectrum.dat](#)

Byte-by-byte Description of file: [list.dat](#)

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HESS collaboration,	Paper I	2018A&A...612A...1H	Cat. J/A+A/612/A1
HESS collaboration,	Paper II	2018A&A...612A...2H	
HESS collaboration,	Paper III	2018A&A...612A...3H	
HESS collaboration,	Paper IV	2018A&A...612A...4H	
HESS collaboration,	Paper V	2018A&A...612A...5H	Cat. J/A+A/612/A5
HESS collaboration,	Paper VI	2018A&A...612A...6H	Cat. J/A+A/612/A6
HESS collaboration,	Paper VII	2018A&A...612A...7H	Cat. J/A+A/612/A7
HESS collaboration,	Paper VIII	2018A&A...612A...8H	
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(End) Patricia Vannier [CDS] 10-Feb-2017

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