

On the connectivity of the Julia sets of meromorphic functions

Krzysztof Barański · Núria Fagella ·
Xavier Jarque · Bogusława Karpińska

Received: 24 January 2013 / Accepted: 21 January 2014
© Springer-Verlag Berlin Heidelberg 2014

Abstract We prove that every transcendental meromorphic map f with disconnected Julia set has a weakly repelling fixed point. This implies that the Julia set of Newton's method for finding zeroes of an entire map is connected. Moreover, extending a result of Cowen for holomorphic self-maps of the disc, we show the existence of absorbing domains for holomorphic self-maps of hyperbolic regions, whose iterates tend to a boundary point. In particular, the

K. Barański is partially supported by Polish NCN Grant N N201 607940. N. Fagella and X. Jarque were partially supported by the Catalan grant 2009SGR-792, and by the Spanish Grants MTM-2006-05849 and MTM-2008-01486 Consolider (including a FEDER contribution) and MTM2011-26995-C02-02. B. Karpińska is partially supported by Polish NCN Grant N N201 607940 and Polish PW Grant 504G 1120 0011 000.

K. Barański
Institute of Mathematics, University of Warsaw, ul. Banacha 2, 02-097 Warszawa, Poland
e-mail: baranski@mimuw.edu.pl

N. Fagella (✉) · X. Jarque
Departament de Matemàtica Aplicada i Anàlisi, Universitat de Barcelona, 08007 Barcelona, Catalonia, Spain
e-mail: fagella@maia.ub.es

X. Jarque
e-mail: xavier.jarque@ub.edu

B. Karpińska
Faculty of Mathematics and Information Science, Warsaw University of Technology,
Pl. Politechniki 1, 00-661 Warszawa, Poland
e-mail: bkarpin@mini.pw.edu.pl