

## Electronic Supporting Information (ESI) for

### Investigation of the degradation mechanisms of a variety of organic photovoltaic devices by combination of imaging techniques – The ISOS-3 inter-laboratory collaboration

Roland Rösch<sup>a</sup>, David M. Tanenbaum<sup>b,c</sup>, Mikkel Jørgensen<sup>b</sup>, Marco Seeland<sup>a</sup>, Maik Bärenklau<sup>a</sup>, Martin Hermenau<sup>d</sup>, Eszter Voroshazi<sup>e</sup>, Matthew T. Lloyd<sup>f</sup>, Yulia Galagan<sup>g</sup>, Birger Zimmermann<sup>h</sup>, Uli Würfel<sup>h</sup>, Markus Hösel<sup>b</sup>, Henrik F. Dam<sup>b</sup>, Suren A. Gevorgyan<sup>b</sup>, Suleyman Kudret<sup>i</sup>, Wouter Maes<sup>i</sup>, Laurence Lutsen<sup>j</sup>, Dirk Vanderzande<sup>i</sup>, Ronn Andriessen<sup>g</sup>, Gerardo Teran-Escobar<sup>k</sup>, Monica Lira-Cantu<sup>k</sup>, Agnès Rivaton<sup>l</sup>, Gülşah Y. Uzunoğlu<sup>m</sup>, David Germack<sup>n</sup>, Birgitta Andreasen<sup>b</sup>, Morten V. Madsen<sup>b</sup>, Kion Norrman<sup>b</sup>, Harald Hoppe<sup>a,\*</sup> and Frederik C. Krebs<sup>b</sup>

<sup>a</sup> Institute of Physics, Ilmenau University of Technology, Weimarer Str. 32, 98693, Ilmenau, Germany

<sup>b</sup> Department of Energy Conversion and Storage, Technical University of Denmark, Frederiksborgvej 399, DK-4000 Roskilde, Denmark

<sup>c</sup> Department of Physics and Astronomy, Pomona College, Claremont, CA, 91711, USA

<sup>d</sup> Arbeitsgruppe Organische Solarzellen (OSOL), Institut für Angewandte Photophysik, Technische Universität Dresden, 01062, Dresden, Germany

<sup>e</sup> Imec, Kapeldreef 75, 3000 Leuven, Belgium and Katholieke Universiteit Leuven, ESAT, Kasteelpark Arenberg 10, 3000, Leuven, Belgium

<sup>f</sup> National Renewable Energy Laboratory, Golden, CO, 80401, USA

<sup>g</sup> Holst Centre, High Tech Campus 31, 5656 AE Eindhoven, The Netherlands

<sup>h</sup> Fraunhofer Institute for Solar Energy Systems ISE, Heidenhofstrasse 2, D-79110, Freiburg, Germany

<sup>i</sup> Hasselt University, Campus, Agoralaan 1, Building D, WET/OBPC, B-3590 Diepenbeek, Belgium

<sup>j</sup> IMEC, IMOMECA associated laboratory, Campus University of Hasselt, Wetenscharpspark 1, B-3590, Diepenbeek, Belgium

<sup>k</sup> Centre d'Investigació en Nanociència i Nanotecnologia (CIN2, CSIC), Laboratory of Nanostructured Materials for Photovoltaic Energy, ETSE, Campus UAB, Edifici Q, 2nd Floor, E-08193, Bellaterra (Barcelona), Spain

<sup>l</sup> Clermont Université, Université Blaise Pascal, Laboratoire de Photochimie, Moléculaire et Macromoléculaire (LPMM), BP10448 Clermont-Ferrand, France and CNRS, UMR6505, LPMM, F-63177, Aubière, France

<sup>m</sup> TÜBİTAK National Metrology Institute (UME), Photonic and Electronic Sensors Laboratory, P.O. Box 54, 41470, Gebze, Kocaeli, TURKEY

<sup>n</sup> Condensed Matter Physics, Brookhaven National Lab, Building 510B Upton, NY, 11973

Within this electronic supporting information all images revealed by luminescence imaging, dark lock-in thermography and light beam induced current for all samples of the cycle experiment, described in the experimental section of the main article, are displayed in an ordered manner. The following three tables depict the ELI/PLI, DLIT and LBIC images for each of the seven devices for all three points of degradation. Please note that the devices' areas range from less than 10 mm<sup>2</sup> up to about 5 cm<sup>2</sup> and all images are scaled to fit their box in the tables.

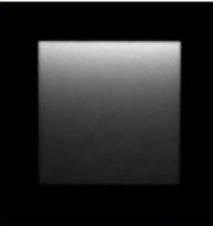
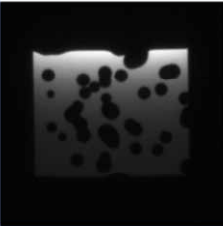

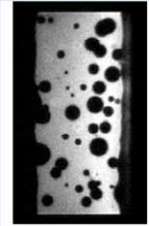
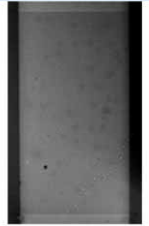
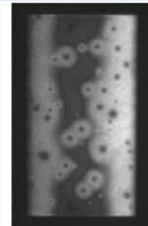
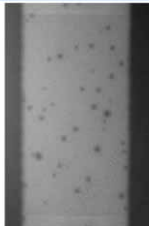
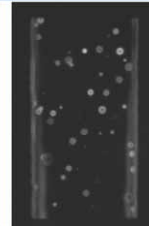
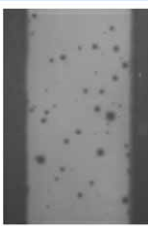
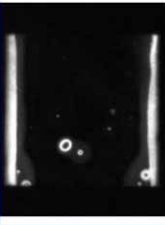

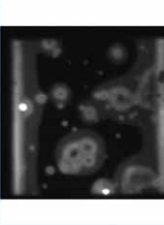
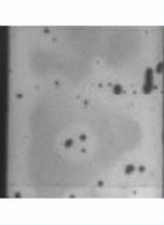



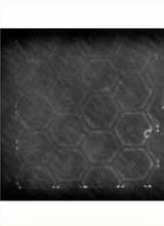


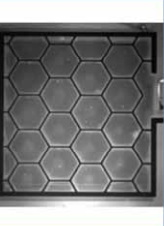
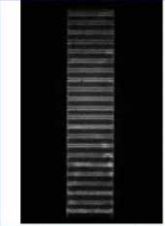




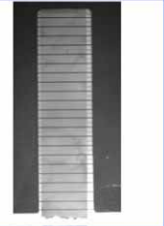












ELI / PLI	First time		Second time		Third time	
IAPP 10-2		N/A		N/A		N/A
IMEC 15-1						
NREL 35-5						N/A
HOLST 46						
ISE 50-03						
RISØP 70						
RISØS 82						

Figure S 1: ELI (left) and PLI (right) images for all seven devices of the cycle experiment.

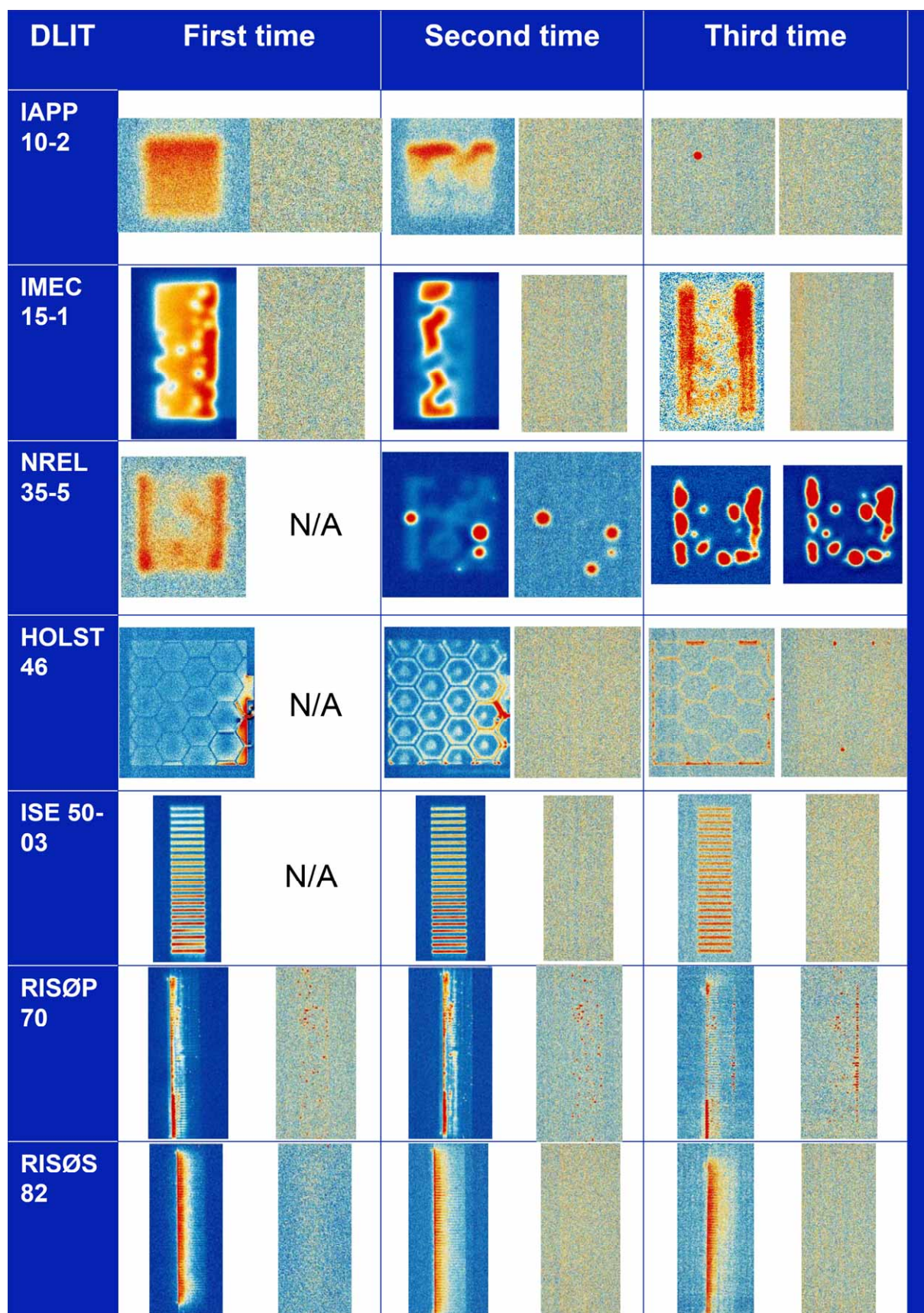


Figure S 2: DLIT images under forward bias (left) and reverse bias (right) for all seven devices of the cycle experiment.



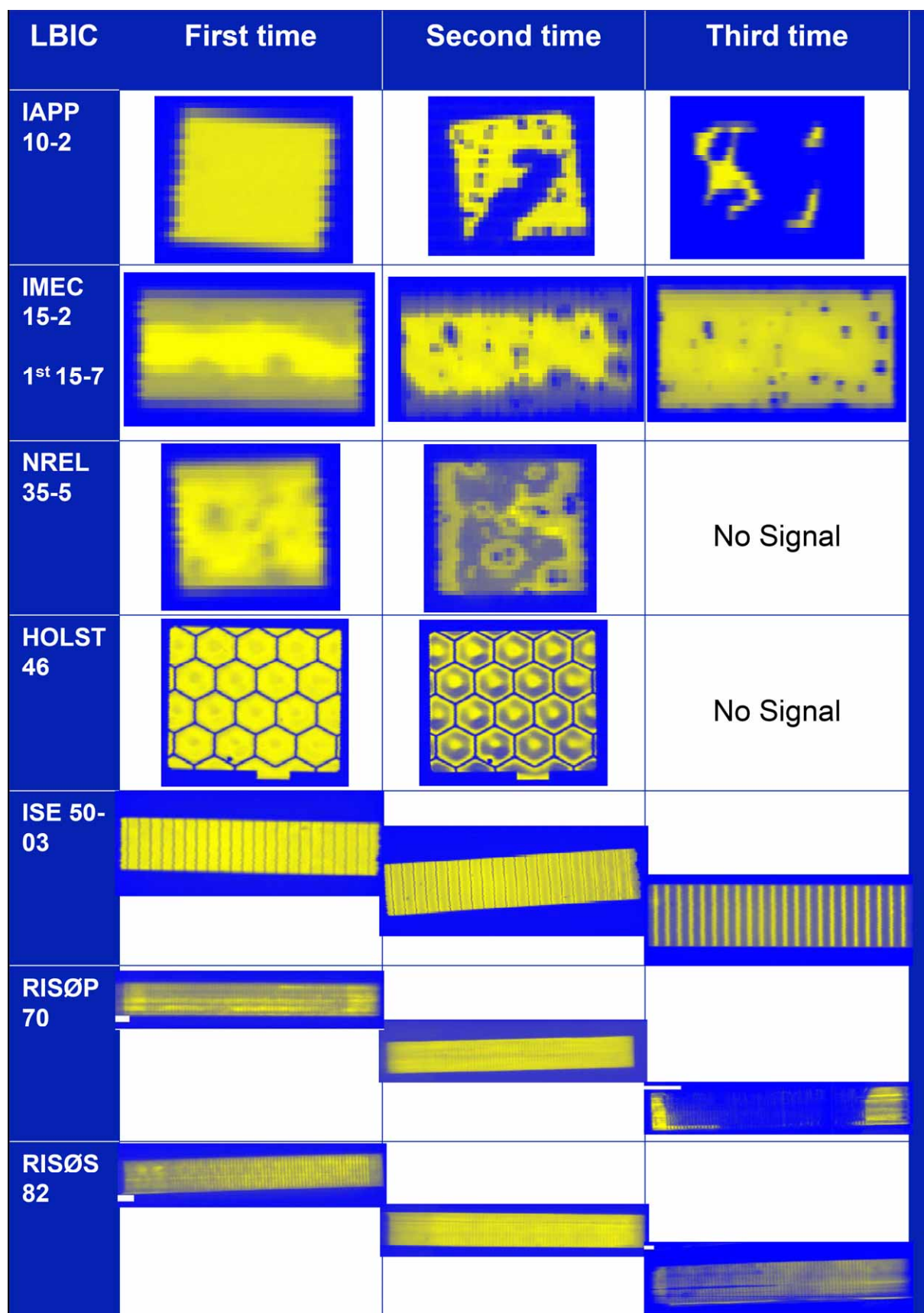


Figure S 3: LBIC images for all seven devices of the cycle experiment.