



IEEE COMPONENTS, PACKAGING AND  
MANUFACTURING TECHNOLOGY SOCIETY



Advancing Technology  
for Humanity

## IEEE CPMT Switzerland Chapter Technical Seminar

# Reliability of Electronic Devices

EMPA Zurich, 3<sup>rd</sup> May 2017

As part of the course of regular technical presentation sessions, CPMT Switzerland chapter is organizing a distinguished lecture session about Reliability. The goal of this seminar is to refresh and complete your knowhow in Probabilistic Design for Reliability. Furthermore it is a platform where people can exchange information about their activities, interests and solutions.

---

## Program

### 15:30 – 17:00 Probabilistic Design for Reliability (PDfR) in Electronics and Photonics

*E. Suhir, Portland State University, Portland, OR, USA, Technical University, Vienna, Austria, and ERS Co., USA, 727 Alvina Ct., Los Altos CA 94024, USA*

The recently suggested probabilistic design for reliability (PDfR) concept in electronics and photonics is based on

- 1) highly focused and highly cost-effective failure oriented accelerated testing (FOAT),
- 2) simple and physically meaningful predictive modeling (PM)
- 3) subsequent FOAT-and-PM-based sensitivity analyses (SA) using the methodologies and algorithms developed as by-products at the two previous steps.

The PDfR concept proceeds from the recognition that nothing is perfect and that the difference between a highly reliable and an insufficiently reliable product is “merely” in the level of the probability of its failure.

The PDfR analysis enables one also to check if the product is not over-engineered. It has to be adequate for the given product and application.

The major PDfR concepts are illustrated by practical examples. We show how the recently suggested powerful and flexible Boltzmann-Arrhenius-Zhurkov (BAZ) model and its multi-parametric extension could be successfully employed to predict, quantify and assure operational reliability. The emphasis is on inhomogeneous solder joint interconnections and on solder joint ball-grid-array (BGA), column-grid-array (CGA) and Quad-Flat-No-lead (QFN) designs, experiencing thermal and mechanical (random vibrations) loading.

It is concluded that the PDfR concept and its methodologies can be accepted as an effective means for the evaluation of the operational reliability of electronic, photonic materials and products.

**17:00 – 18:00**

**Apéro / Networking**

---

Location: EMPA Dübendorf, Überlandstrasse 129, 8600 Dübendorf

Room: VE102, Auditorium Dübendorf

Contact: Daniel Thommen +41 44 455 35 14

Web: [www.ieee.ch/chapters/cpmt](http://www.ieee.ch/chapters/cpmt), <https://www.empa.ch/web/empa>

**Please register by E-mail ([daniel.thommen@microdul.com](mailto:daniel.thommen@microdul.com)) before 24<sup>th</sup> April 2017**