

# *RamanRxn Systems*

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## **Raman Spectroscopy**

### *PAT Tool for Tablet Analysis*

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Dr. Carsten Uerpmann  
*Kaiser Optical Systems*  
France

# ***KOSI Raman Analyzers...***

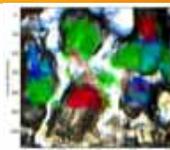
**Discovery/  
Research**

**Product  
Development**

**Process  
Development**

**Production/  
Manufacture**

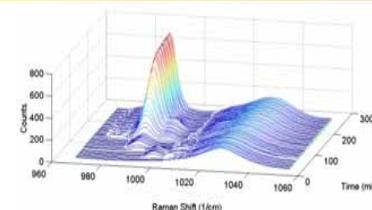
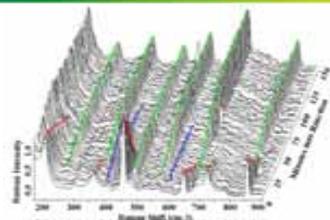
**Microscopy & Screening (HTS)**



**Reaction Monitoring & Control**

**Optimization  
& Scale-up**

**Methods Development  
Monitoring, & Control**



**Formulation / Solid State Chemistry / Quality Control**

# *PhAT* \*System – PAT tool

\* Pharmaceutical Area Testing

⇨ Solid, oral dosage forms comprise the largest class of pharmaceutical formulations

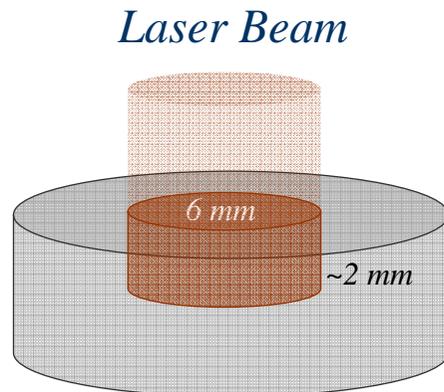


⇨ The aim of this work was to explore the applicability of Raman spectroscopy to the analysis of tablet dosage forms

# Tablet Analysis with *P<sup>h</sup>AT* System

## Specification

- ↪ Spot Size:  $\varnothing$  6 mm - sampling depth ~2 mm !!
- ↪ Laser power: 200mW
- ↪ Multiple Fiber Collection



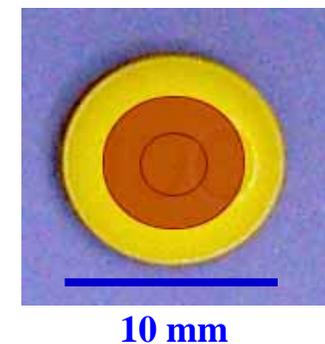
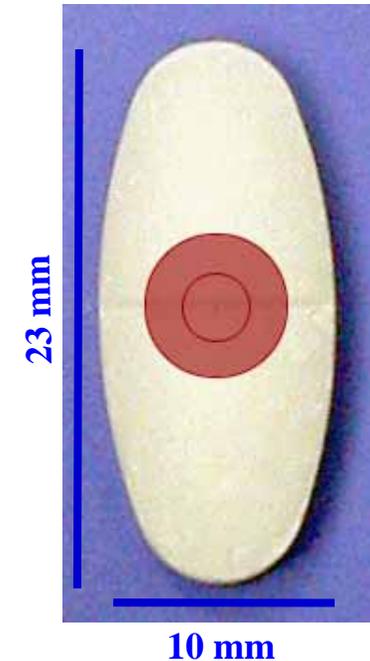
*analyzed volume of solid sample*



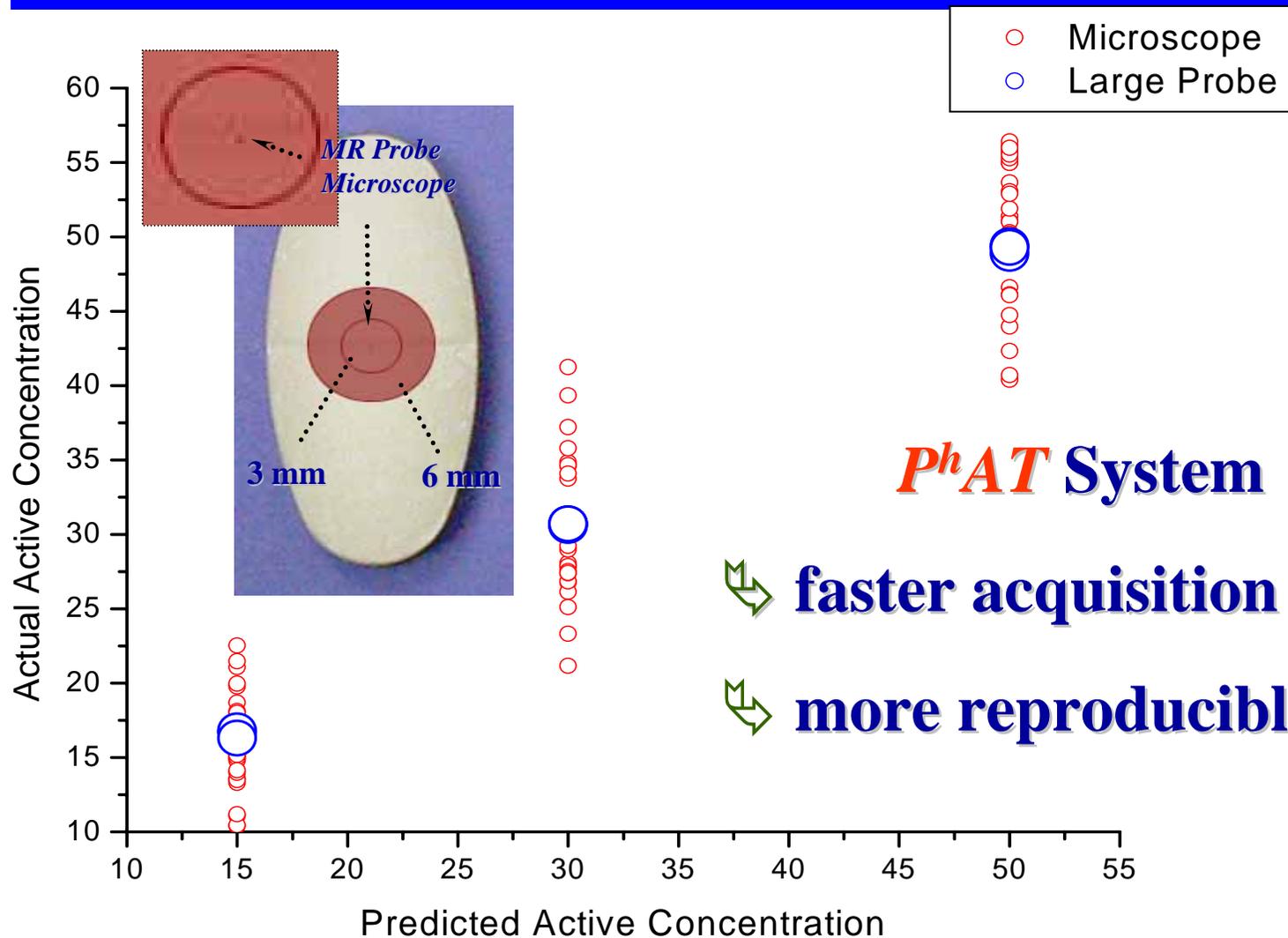
# *Representative Measurement*

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- ❖ Solid state mixtures are difficult to analyze reproducibly by traditional Raman analyzers.
- ❖ The small spot size used can make the analysis prone to heterogeneity errors.
- ❖ This is a recognized source of error. Several approaches used to try to address this, including
  - ❖ sample rotation
  - ❖ repeat sampling
- ❖ The *PhAT System* has been designed to address the limitations of traditional Raman system for quantitative analyses of solid state chemistry.



# PhAT System vs. Microscope



**PhAT System**

**faster acquisition times**

**more reproducible results**

# *Granulator Interface*

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**Granulation  
Bowl  
(lid removed)**

**Chopper**

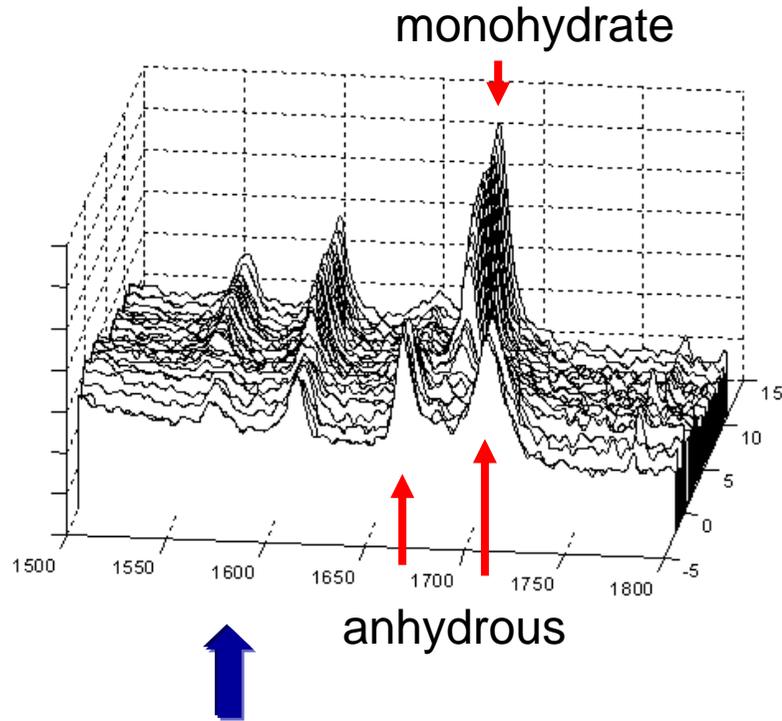
*MR Probe  
with NCO-2.5*

*PhAT System  
Probehead*



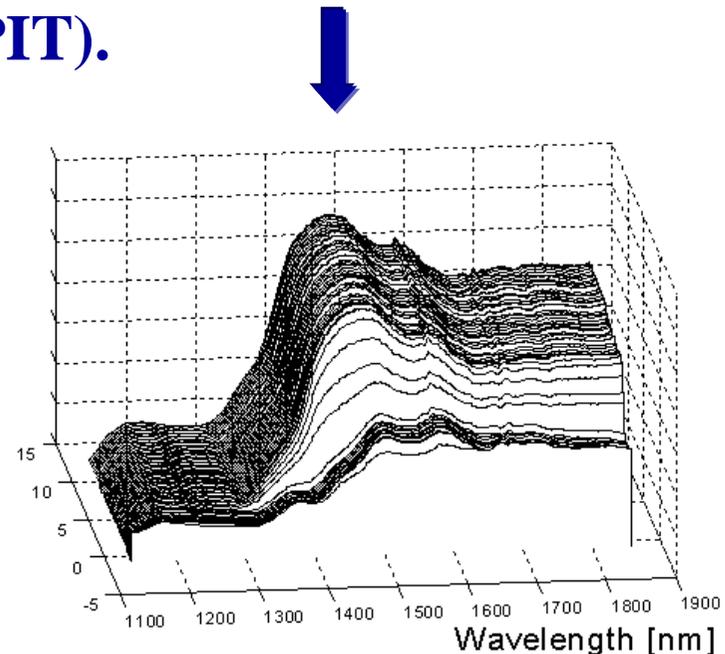
*MR Probe  
with IO-1/4"*

# Comparing NIR and Raman

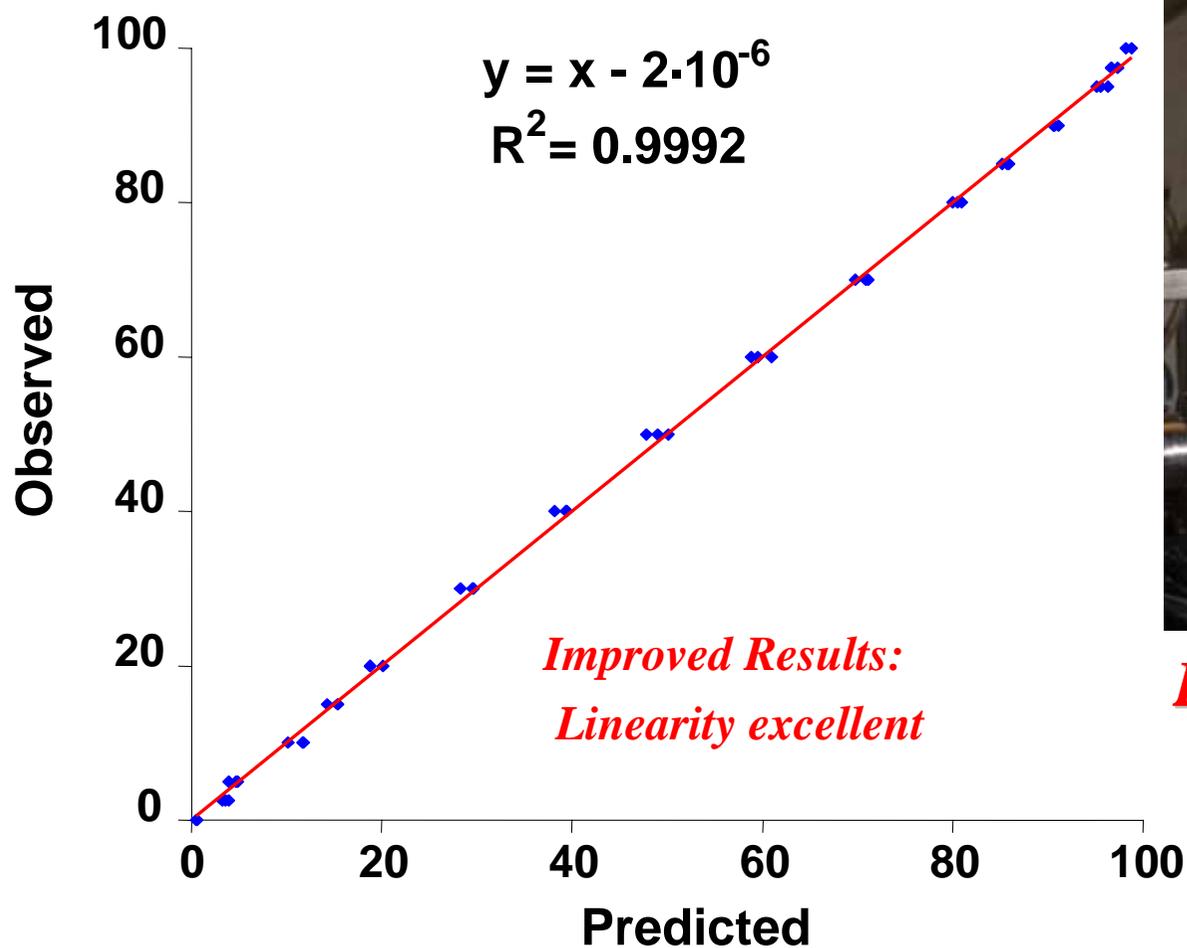


**Raman:** Clearly identifiable bands are observed for both the monohydrate and anhydrous forms.

**NIR:** Spectrum dominated by free water, prevented quantization of the forms during the transformation (PIT).



# Nitrofurantoin Granulation- Large Spot Size (6 mm)



*PhAT System*

# RamanRxn Systems

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**Kaiser Optical Systems SARL**  
5, allée du Moulin Berger  
69130 Ecully

☎ +33 437.49.90.73  
<http://www.kosi.com>  
[uerpmann@kosi.com](mailto:uerpmann@kosi.com)

