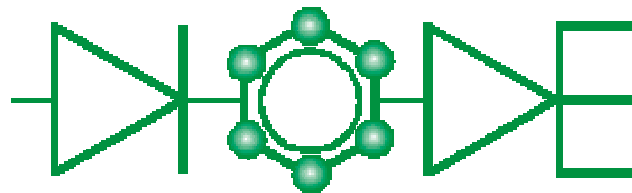


Miruna-Elena Noaghi

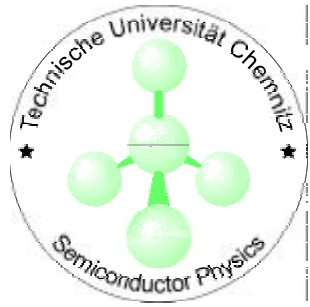
26th July 2002 Dublin



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Miruna E. Noaghi
TU Chemnitz



Scientific background

- „Babes-Bolyai“ University Cluj-Napoca, Romania

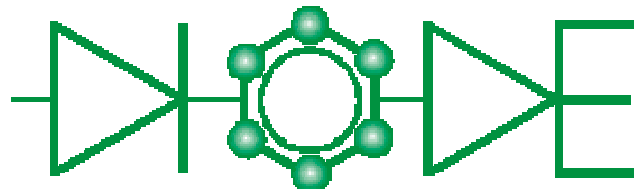
- Bachelor degree and diploma work in the field of Electronics: „Analog-Digital and Digital-Analog Converters“ (1990-1995)
- Master of Science Studies in collaboration with University Würzburg, „Influence of Mn, V and U on $2(\text{P}_2\text{O}_5)\text{PbO}$ with Raman Spectroscopy“ (1996-1997)

- physics teacher
 - „Theoretical High School“ Cisnădie (1995-1998)
 - „Colegiul National G. Cosbuc“ Cluj-Napoca (1998-2001)

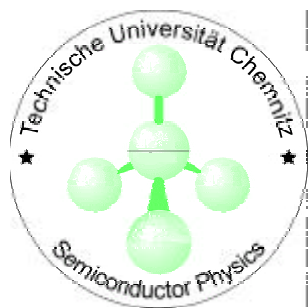
- January 2002 – joined the DIODE network



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Responsibilities in the Network

Experimental Methods

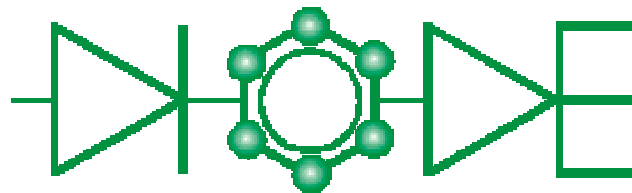
- IV and CV measurements
- Deep Level Transient Spectroscopy (C-DLTS, Q-DLTS)

Main Task

- determination of trap parameters in organic solids

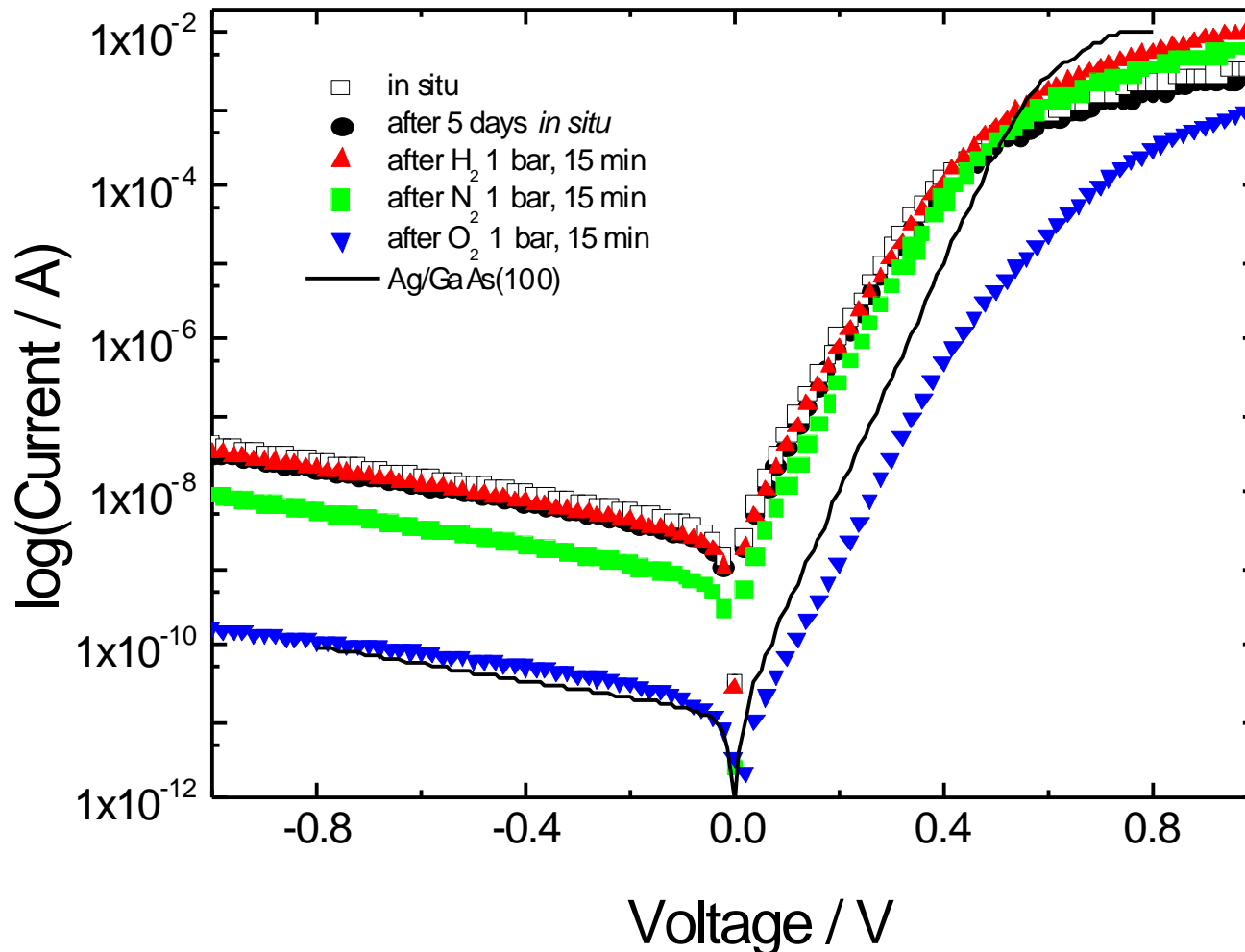


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I/V Characteristics of Ag/PTCDA/GaAs(100) Diodes



Storage in UHV, H_2 and N_2 exposure:

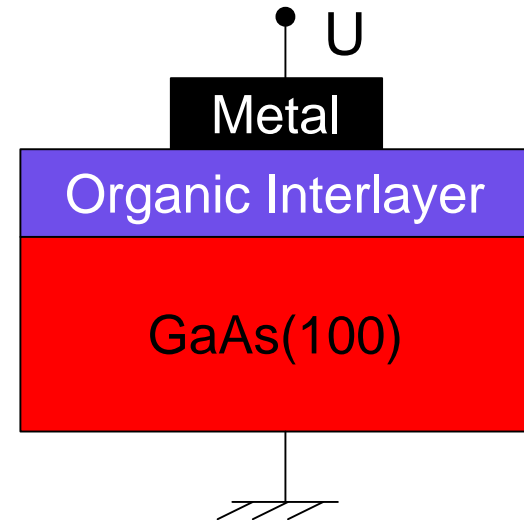
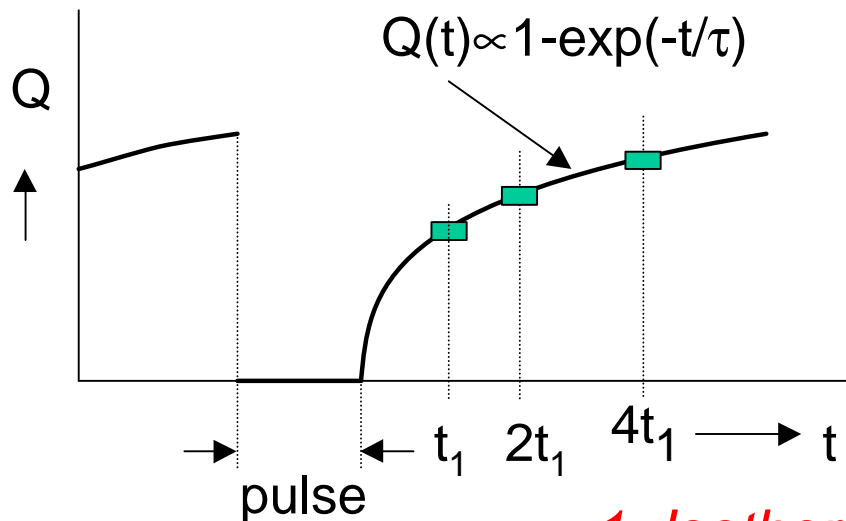
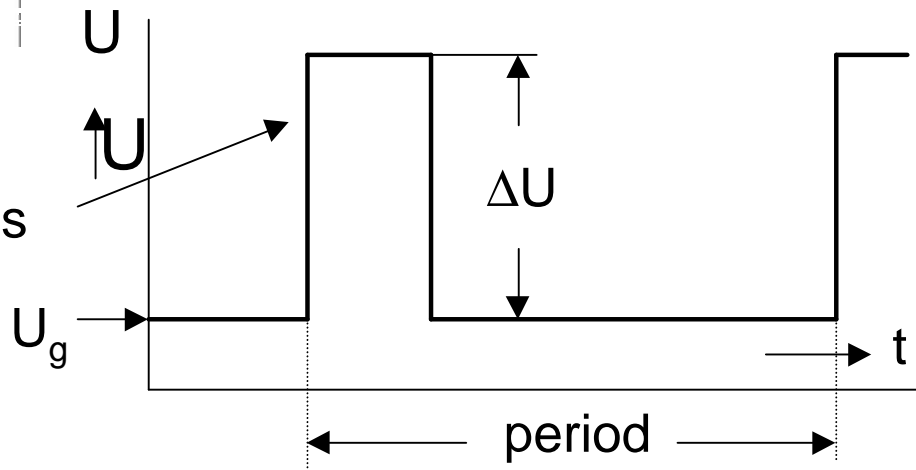
IV characteristics are almost unchanged → barrier height is constant

O_2 exposure:

Current is decreased → Barrier height increases by ~ 200 meV.

Charge Deep Level Transient Spectroscopy (Q-DLTS)

applied bias



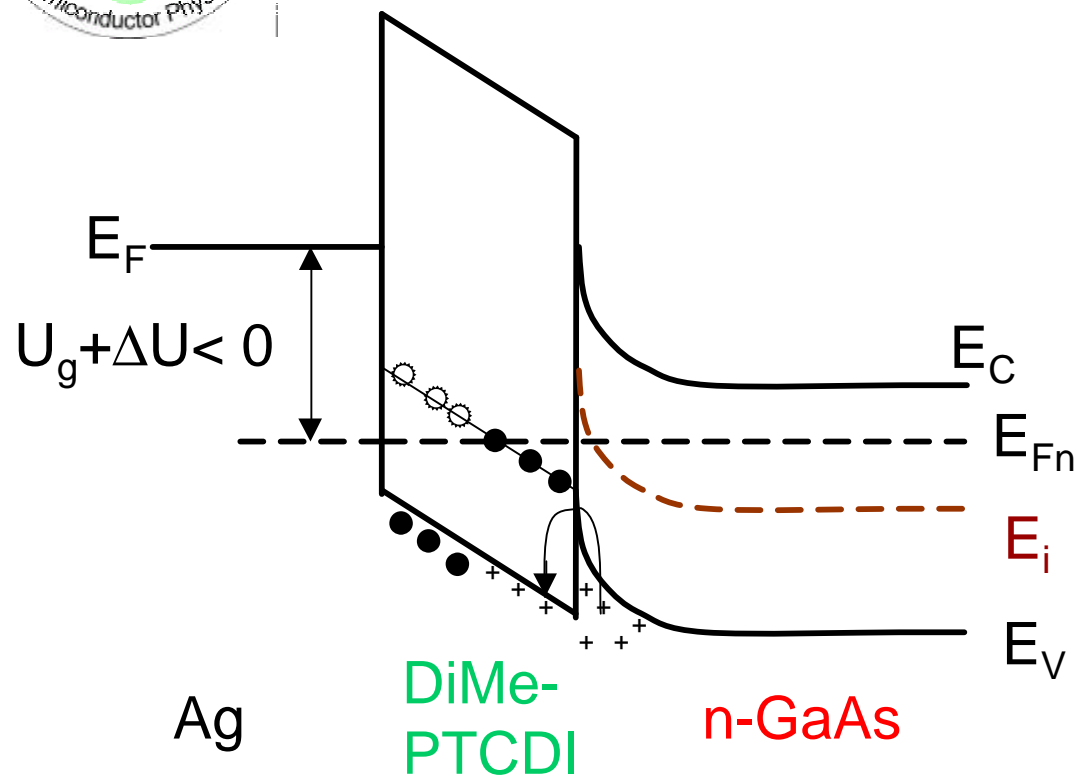
$$\Delta Q = Q(t_1) - 3/2 Q(2t_1) + 1/2 Q(4t_1)$$

$$\Delta Q_{\max}(t_1) \longrightarrow \tau_{\max} \approx t_1$$

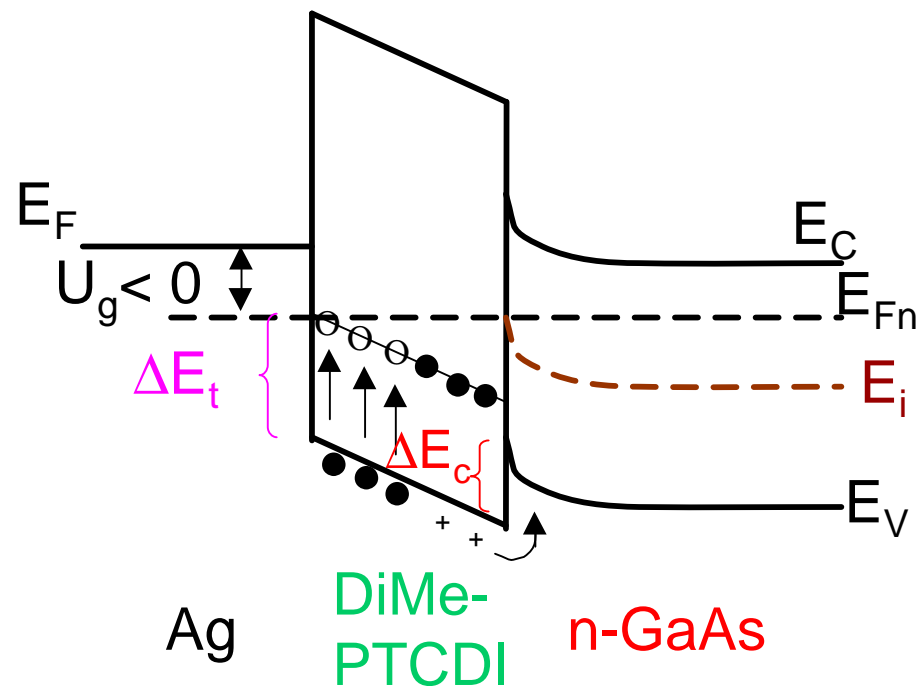
1. Isothermal DLTS

2. Tempscan-DLTS

Energy Band Diagrams



during the pulse

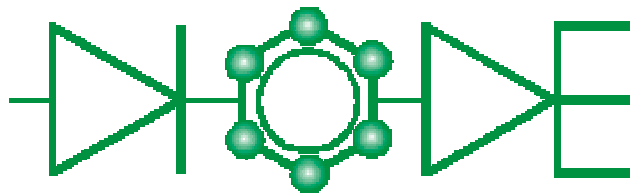


after the pulse

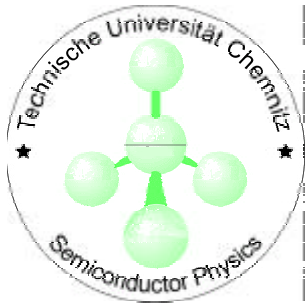
$$\Delta E_t = E_t - E_{\text{HOMO}}$$



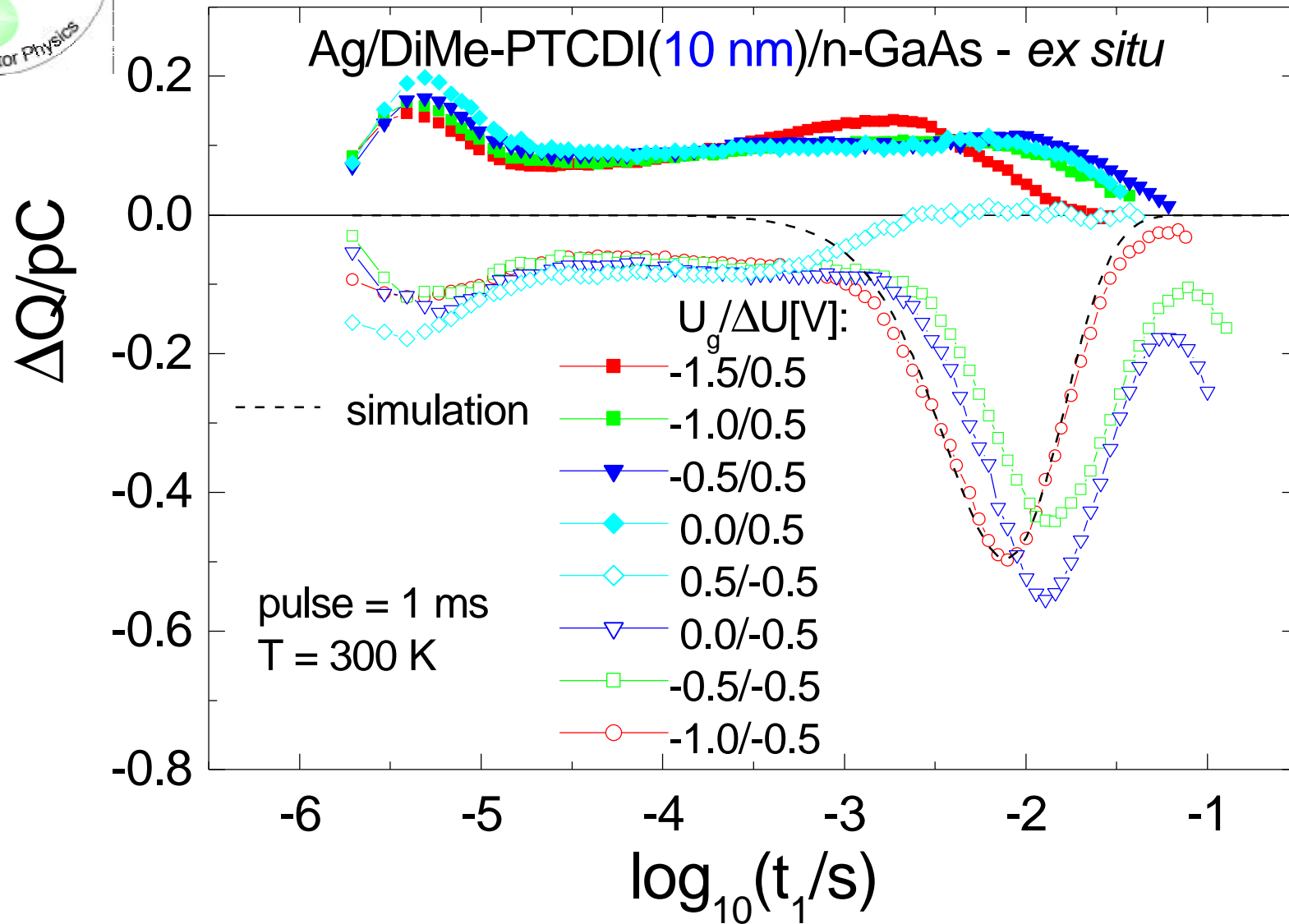
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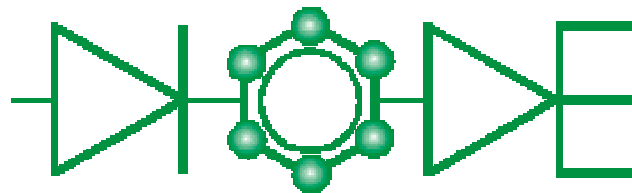
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1. Isothermal DLTS



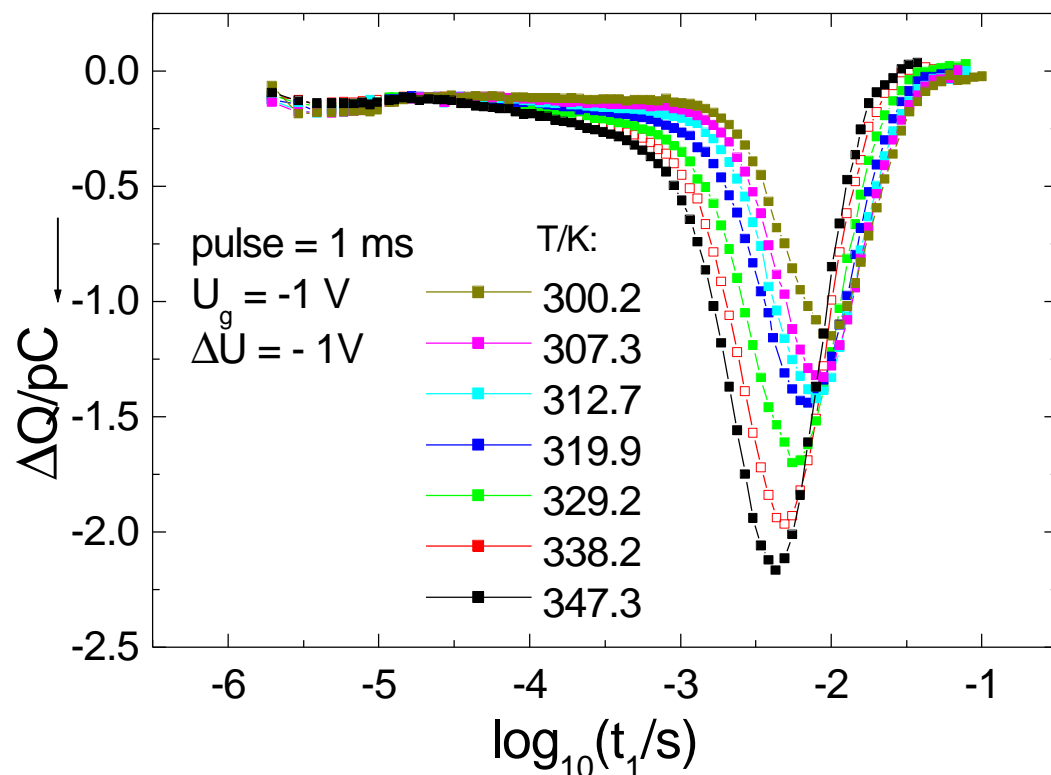
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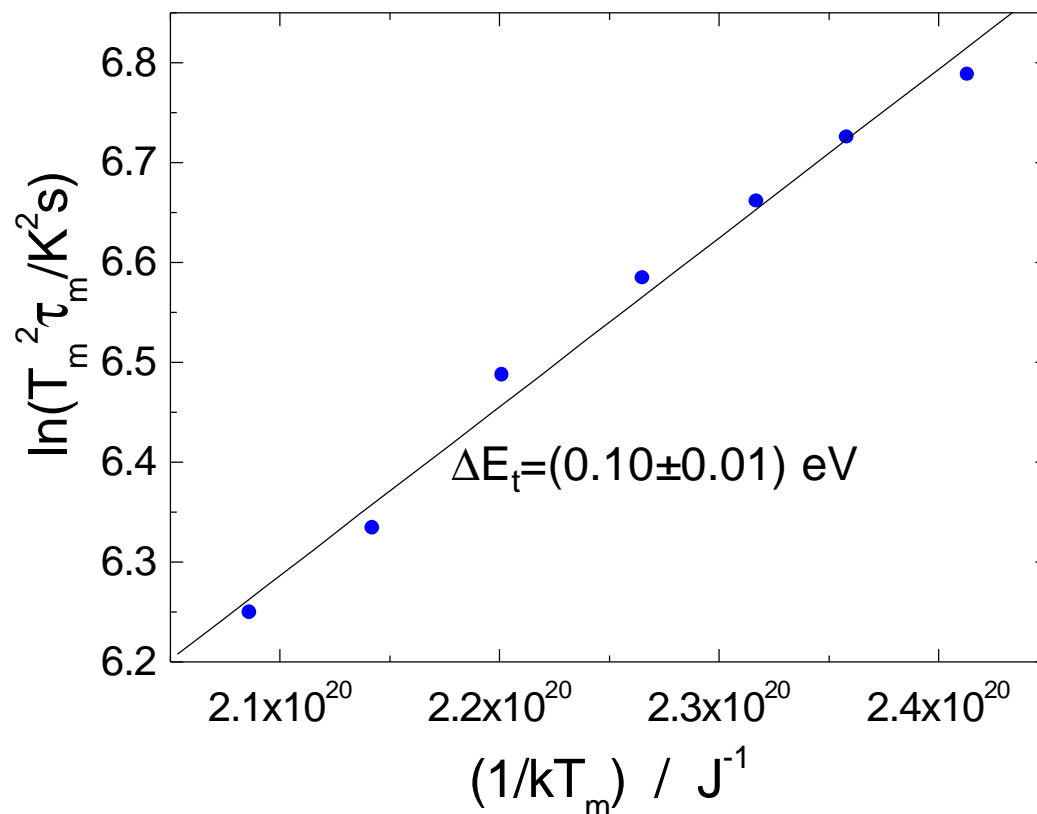
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Thermal activation energy

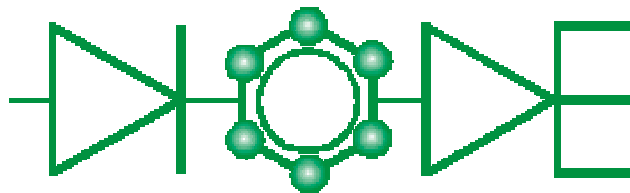
Ag/DiMe-PTCDI(10 nm)/n-GaAs - *ex situ*



Ag/DiMe-PTCDI(10 nm)/n-GaAs - *ex situ*

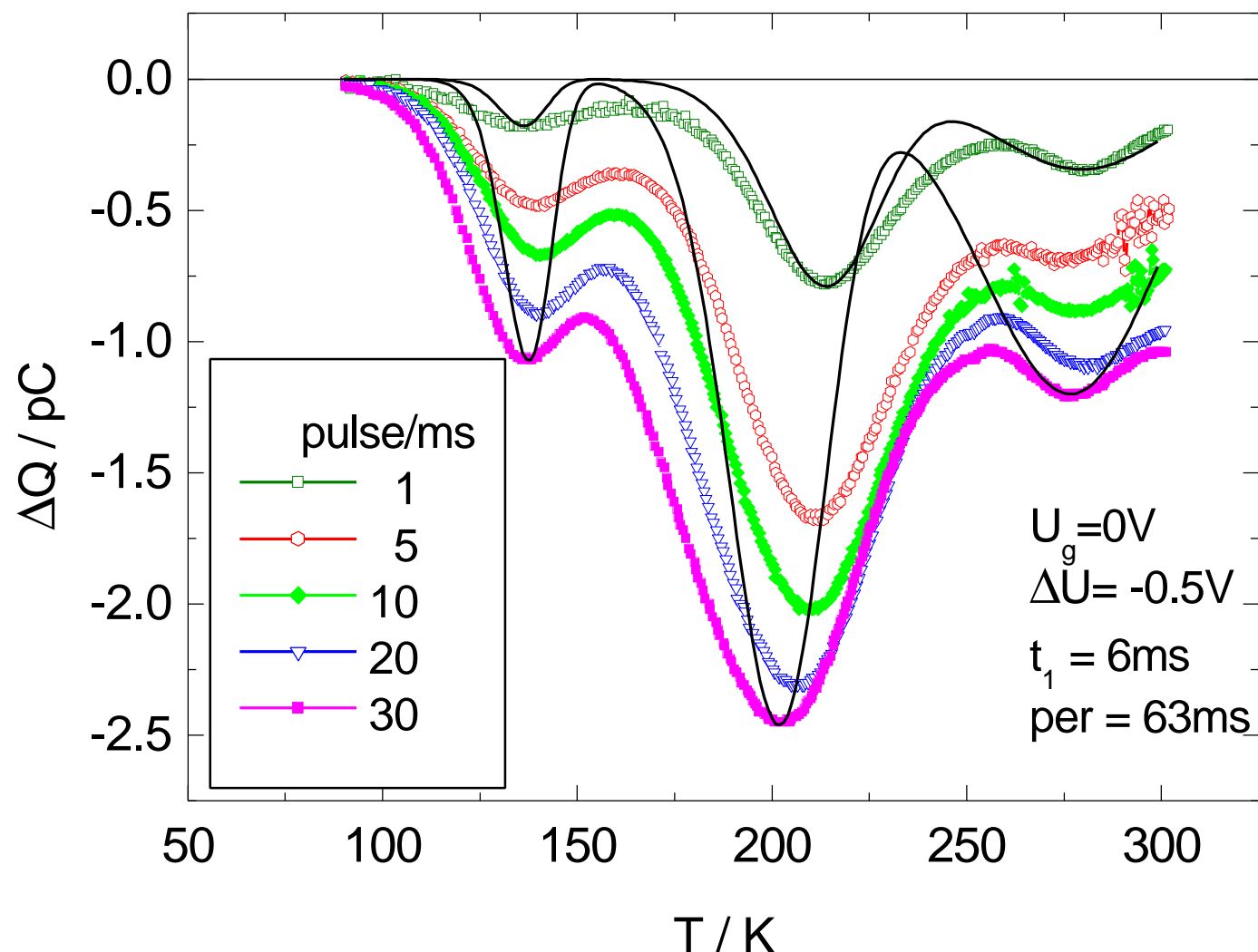


ΔE_t = energy offset between E_t and transport band for holes in DiMe-PTCDI (HOMO?)

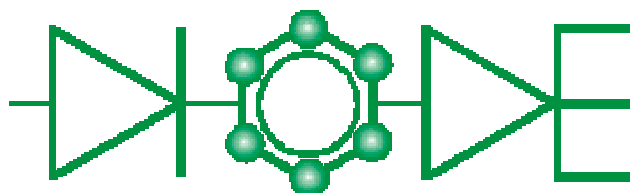


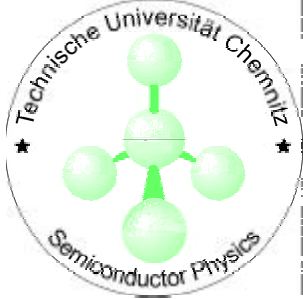
2. Tempscan-DLTS at different pulse widths

Ag/PTCDI(60 nm)/n-GaAs - *ex situ*



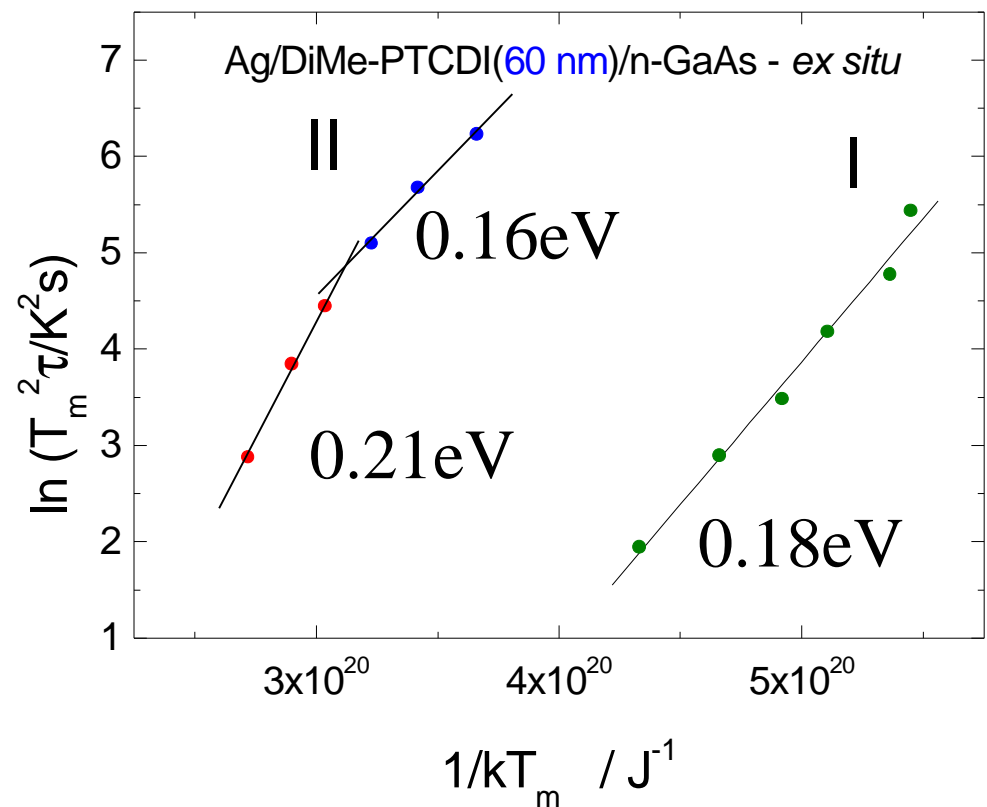
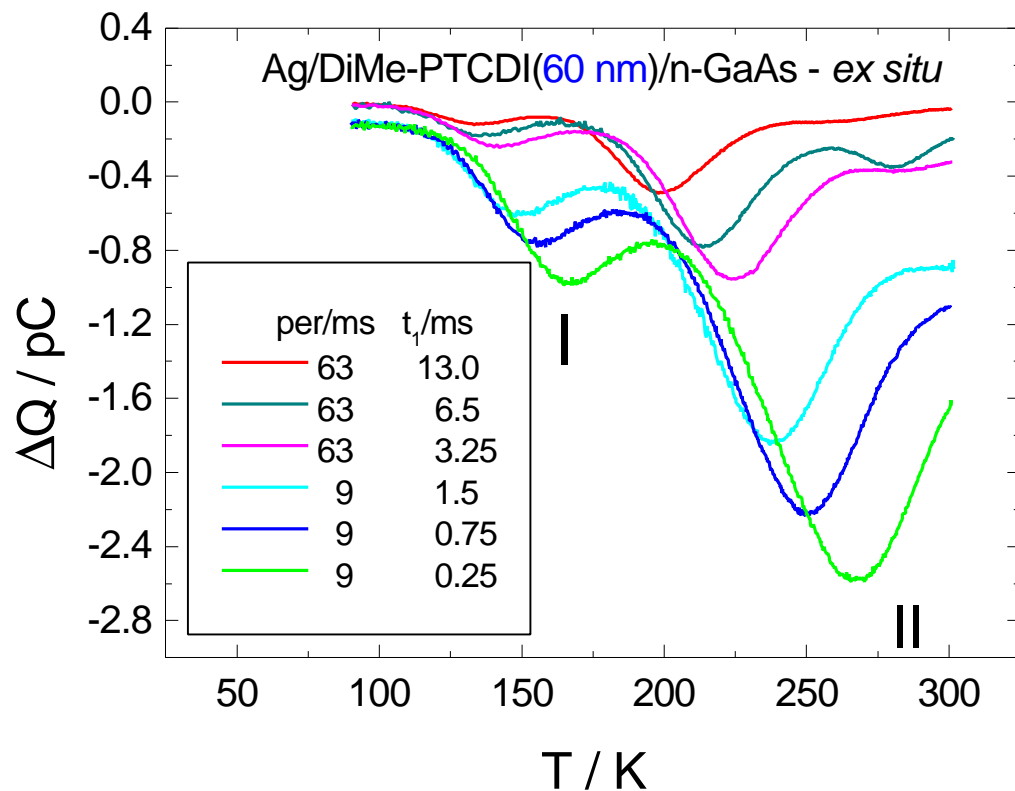
Pulse (ms)	FWHM (K)
1	45
5	56.3
10	61
20	65.8
30	73.2





Thermal Activation Energies

Arrhenius` plots



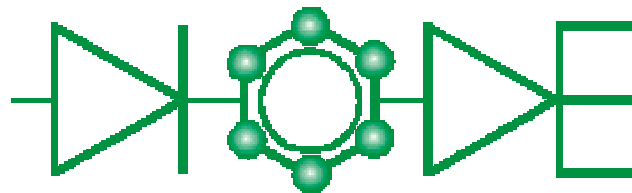
$U_g = 0V$

$\Delta U = -0.5V$

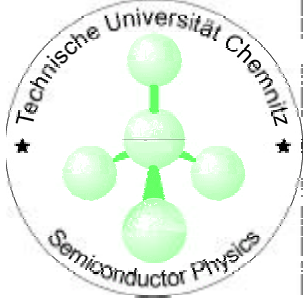
pulse = 1ms



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Experience in the Network

- *Positive training experience in the group:*

Group members with more experience are always ready to give advices

Technical problems are promptly solved and the necessary materials can always be found

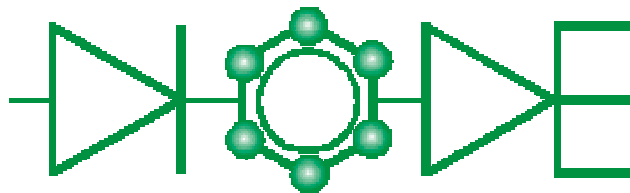
- *Positive training experience in the network:*

Participation in one workshop held in Madrid. Instruction and oral presentations about AFM, STM and theoretical simulation

E-mail contact with other DIODE members



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**Miruna E. Noaghi
TU Chemnitz**