**Agenda**

**Today's agenda:**
- brief introduction → D.A.
- funding situation → M. Schädel
- physics with TASCA → F.P. Heßberger
- results of the recent experiment(s) → A. Semchenkov
- performance of the present setup
  - 16-strip detector with "SHIP" electronics → J. Khuyagbaatar
  - 16-strip detector with COMPACT electronics → A. Yakushev
- experience with RITU (Cath Scholey)
- design of the optimal detector for TASCA → A. Gorshkov
- completion of the setup
  - PIN-diodes
  - X-ray, gamma ...
  → discussion
- electronics - DAQ
  - digital electronics and pulse shape analysis
  - conventional electronics
    - "SHIP" vs. Dubna/COMPACT
  → discussion
The STOP Detector

- (80x35)mm$^2$ active area
- 16 strips - (5x35)mm$^2$ active area
- 300 µm thickness
- Resistive layer
  - Position resolution = 200 µm ⇒ total spatial resolution ≈ 1 mm$^2$
- Energy resolution $\Delta E = 18\text{-}20\text{ keV} @ E_\alpha > 6\text{ MeV}$
- 32 signals
The Veto and TOF Detectors

- 3 units
  - total efficiency > 99%
- 2 C-foils
  - (55/74x100)mm²
  - entrance foil coated with MgO for more efficient e⁻ emission
  - second foil for homogenous acceleration field
- magnetic deflection onto a pair of micro channelplates
- time resolution ≈ 500 ps
- alternative for TASCA: SED (E. Polacco) or PPAC (L. Corradi, LNL; FMA at ANL)
The Ge-Clover detector

- 4 crystals (70x140)mm²
- Efficiency per crystal
  \[ \varepsilon_\gamma = 23\% \text{ at } 1.3 \text{ MeV} \]
- <2 cm behind STOP detector
- Al-window 0.5 mm thickness
- Total efficiency from \( \alpha-\gamma \) coincidences
  \[ \varepsilon_{\text{exp}} = 15\% \text{ at } E_\gamma = 150 \text{ keV} \]
- Alternative: SHIP clover
  - 4 crystals (50x79)mm²
  - Efficiency per crystal 20% at 1.3 MeV
**Si-strip detector**

- (100x100)$\text{mm}^2$ active area
- 128x128 strips
- 300 $\mu$m thickness
- **Integrated front-end electronics (ASIC)**
  - for single processing of all 128x128 channels
  - including preamp, amplifier, time trigger (leading edge)
PIN diodes
- RITU/GREAT

• GREAT Pin diode array
• (28x28)mm² active area
• 32 elements
• 500 µm thickness
• low noise (capacity) \(\rightarrow\) low energy threshold
New DAQ SHIP

NIM ADC
Silena 7423
13 bit (8k)

NIM ADC multiplexer
AMUX (J. Hoffmann, GSI)

• >> 50 parameters
• max. rate ≈ 50 kHz
• random trigger
• real time clock
• dead time 10 µs

bit pattern
AMUX designed by Jan Hoffmann, GSI

- **read and control 4 for 13 bit (8k) ADC's**
- **scaler function**
- **pattern unit function**
- **TDC function/real time clock**
- **macropuls/target wheel counter**
- **onboard histogramming possible**

**16Mb SDRAM (DSP)**

**max 10 MHz**

**16 bits/channels**

**100 ns resolution**
- daisy chain connection to SAM3 (up to 2x15 units) via GTB bus
- event building and data transfer to DAQ-CPU by the readout processor SAM3
- random trigger (first unit with data triggers readout)
- max rate 50 kHz (tested in the lab)
- high resolution real time clock
Synthesis and Identification of SHE at SHIP

kinematic separation in flight

known

Date: 09-Feb-1996
Time: 22:37 h

identification by $\alpha-\alpha$ correlations to known nuclides

$^{70}$Zn  $^{208}$Pb  $^{277}$112