



SISAK Chemistry Experiments with BGS Activity Present and Future Plans

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The restraints of the past...

- Using pre-separated activity feels like advancing from the medieval dark ages to the modern age...
- The nearly background free spectras makes life so much more enjoyable!

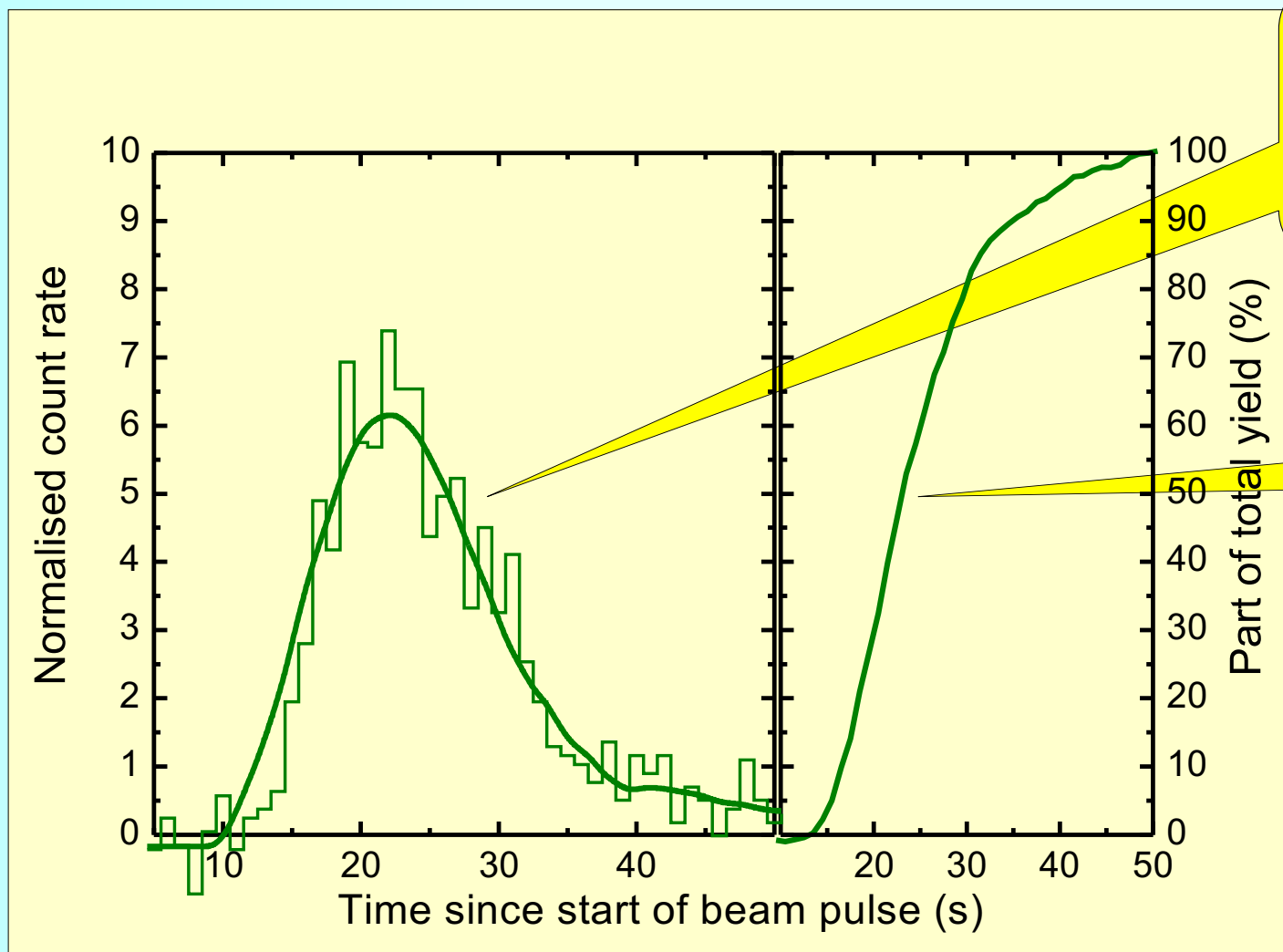




Future plans

- Reduce transport time
 - ▶ 20- 25% reduction improves yield by a factor between 2 and 3 (for ^{257}Rf).
- Improve transfer between gas jet and liquid phase by improved mixer design.
- Develop "pulling" degasser.
 - ▶ Gas jet is driven by suction at chemistry interface, instead of high pressure in the transfer chamber.
 - ▶ Will enable use of thinner BGS/RTC window.
 - ▶ This again might enable use of hot fusion reactions (actinide targets).
- Other plans (not directly related to preseparation):
 - ▶ Second extraction with high yield to measure activity in both phases of first extraction step.
 - ▶ Improve LS detection system (digital acquisition, better and more automated calibration).
 - ▶ Permanent SISAK setup in Berkeley to maximize use of available beam time.

Transport time March 2003



Measured transport time for long-lived activity.

50% yield after 23 s.

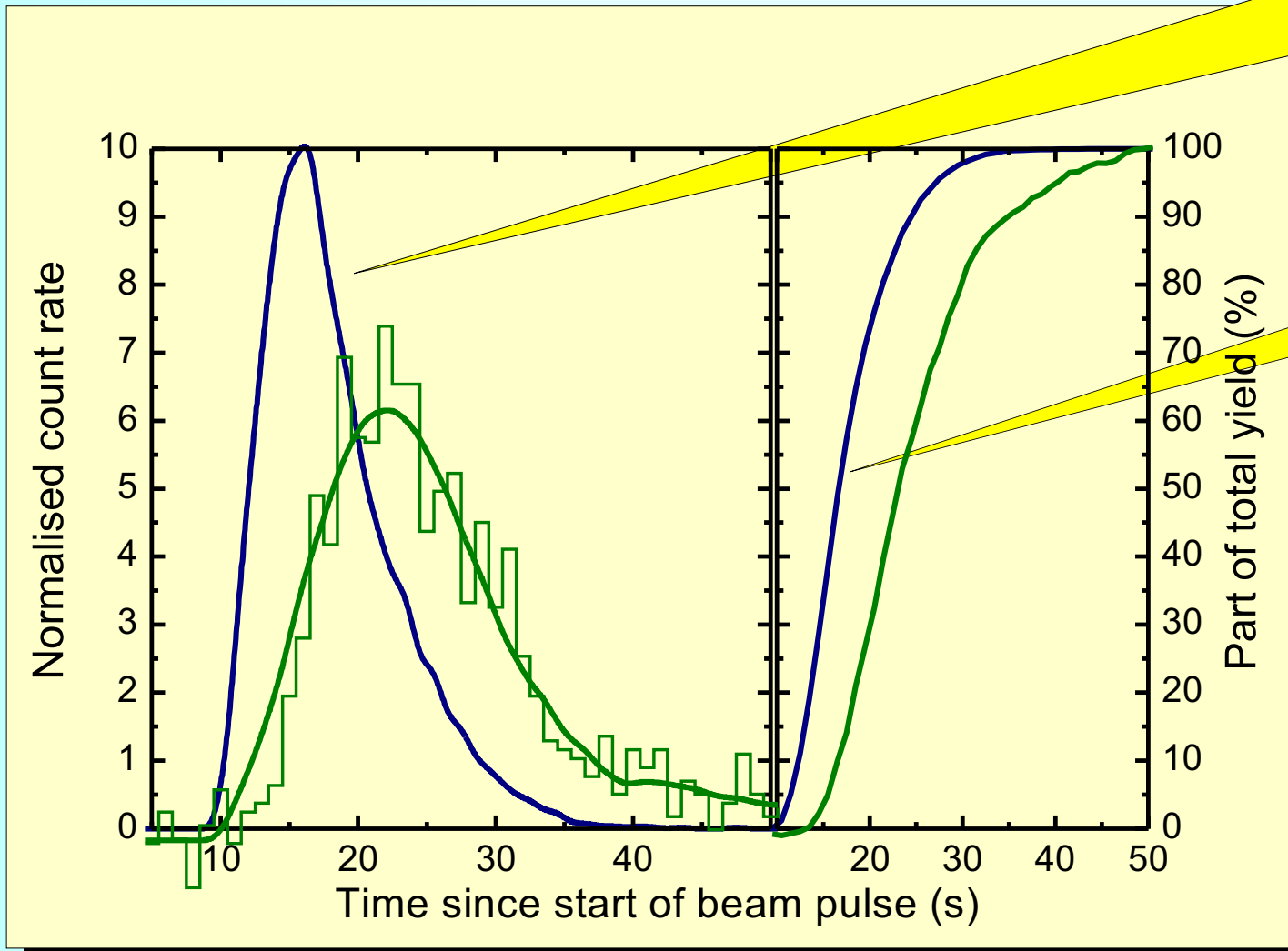
Flow rates:
 Aq.: 0.44 mL/S
 Org.: 0.40 mL/s
 Scint: 0.40 mL/s
 RTC depth: 42 mm
 Gas Jet: 1.70 bar



Transport time March 2003

Monte Carlo simulation of 4 s half-life activity yield.

50% yield after 16.6 s.



Flow rates:
Aq.: 0.44 mL/S
Org.: 0.40 mL/s
Scint: 0.40 mL/s
RTC depth: 42 mm
Gas Jet: 1.70 bar



An Additional Extraction Stage



The liquid-liquid extraction is performed here.

Only the activity in the organic phase is detected.

The activity remaining in the aqueous phase can be detected after a second extraction.

