International Atomic Energy Agency

What TAGS can offer

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Introduction

Current libraries and their problems

WPEC Sub-group 25

Current decay heat predictions

Effect of existing TAGS data

Recommendations for future TAGS

Conclusions

Current decay heat calculations

Decay data libraries:

JEFF-3.1, JENDL-FP-2000, ENDF/B-VI & VII

ALL libraries predict total decay heat reasonably well

Most libraries under predict gamma heat

Most libraries over predict beta heat

WPEC Sub-group 25

GOAL: To assess decay heat calculations

Two meetings convened :

- **12-14 Dec 2005, IAEA, Vienna**
- **4 May 2006, NEA, Paris**

Recommended nuclei to be measured

Current Decay Heat Situation

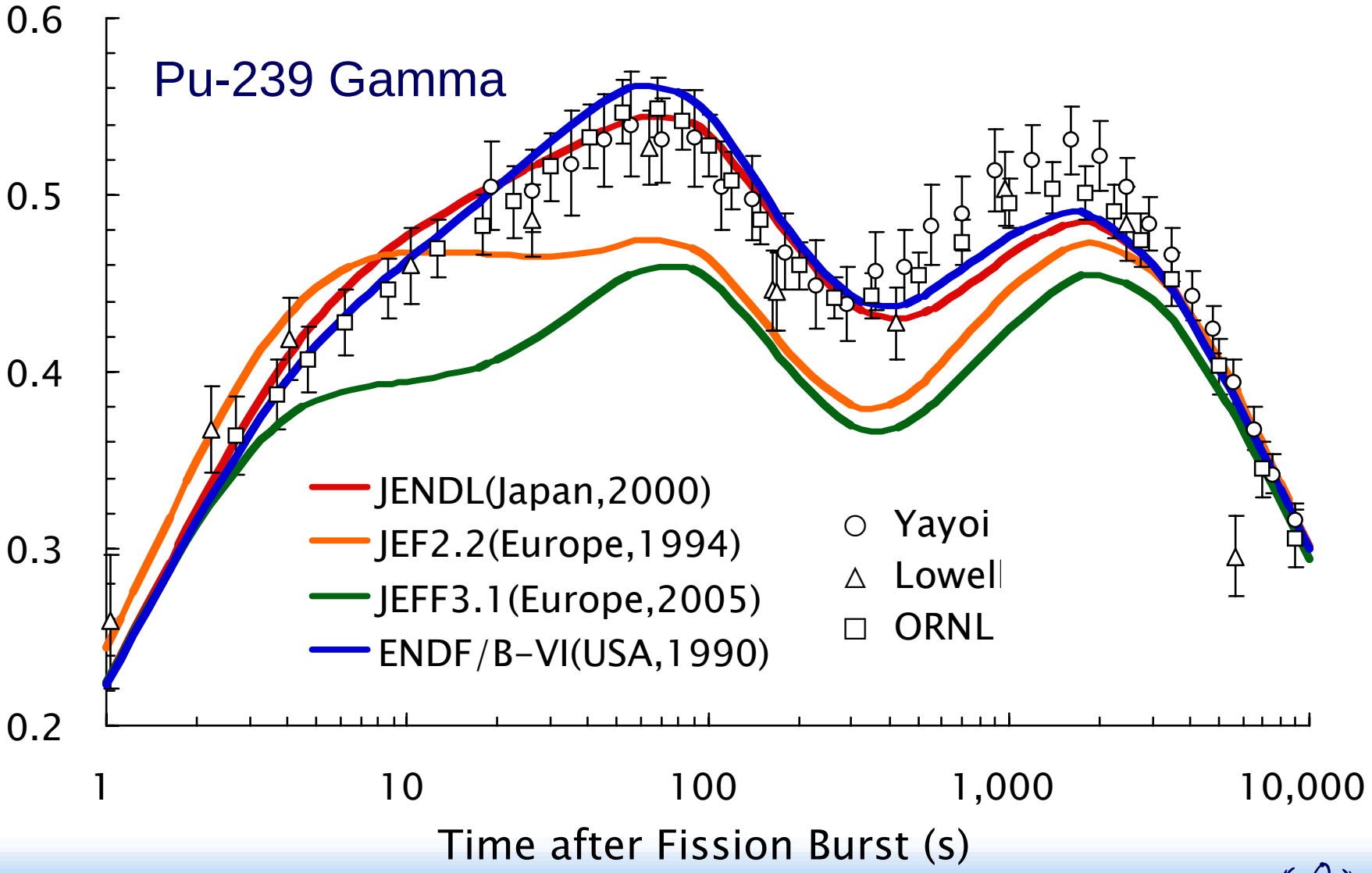

Figure courtesy T. Yoshida

Decay Heat Situation with INEL TAGS

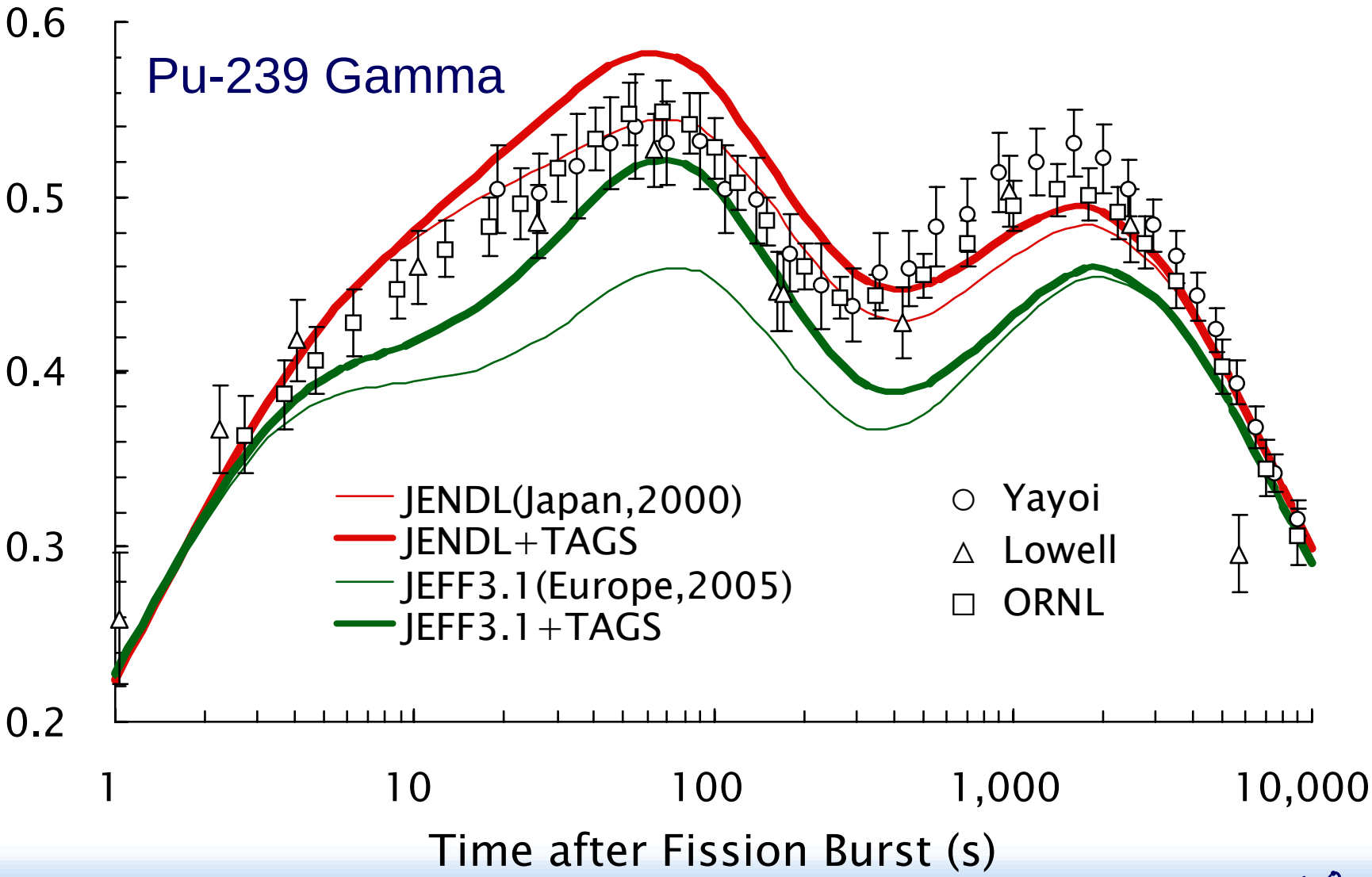

Figure courtesy T. Yoshida

Decay Heat Situation with INEL TAGS + 104/5-Tc

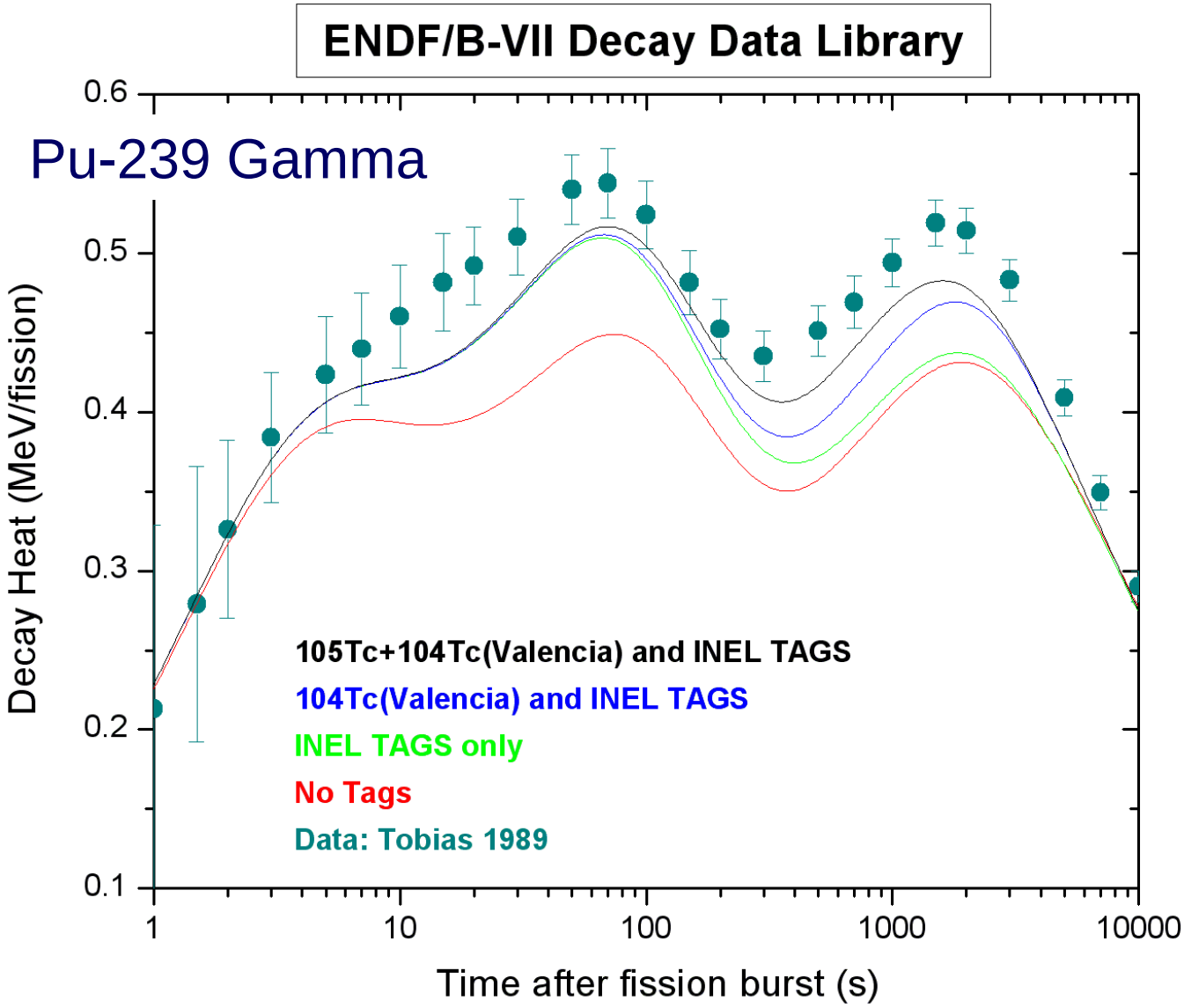

Figure courtesy A. Sonzogni

Recommended TAGS measurements (1)

Nuclide	Q_β-value (keV)	Half-life	Nuclide	Q_β-value (keV)	Half-life
35-Br-86	7626(11)	55.1 s	39-Y-96	7096(23)	5.34 s
35-Br-87	6852(18)	55.65 s	40-Zr-99	4558(15)	2.1 s
35-Br-88	8960(40)	16.36 s	40-Zr-100	3335(25)	7.1 s
36-Kr-89	4990(50)	3.15 min	41-Nb-98	4583(5)	2.86 s
36-Kr-90	4392(17)	32.32 s	41-Nb-99	3639(13)	15.0 s
37-Rb-90m	6690(15)	258 s	41-Nb-100	6245(25)	1.5 s
37-Rb-92	8096(6)	4.49 s	41-Nb-101	4569(18)	7.1 s
38-Sr-89	1493(3)	50.53 d	41-Nb-102	7210(40)	1.3 s
38-Sr-97	7470(16)	0.429 s	42-Mo-103	3750(60)	67.5 s

Recommended TAGS measurements (2)

Nuclide	Q_β-value (keV)	Half-life	Nuclide	Q_β-value (keV)	Half-life
42-Mo-105	4950(50)	35.6 s	53-I-136m	7580(120)	46.9 s
43-Tc-102	4532(9)	5.28 s	53-I-137	5877(27)	24.13 s
43-Tc-103	2662(10)	54.2 s	54-Xe-137	4166(7)	3.82 min
43-Tc-104	5600(50)	18.3 min	54-Xe-139	5057(21)	39.68 s
43-Tc-105	3640(60)	7.6 min	54-Xe-140	4060(60)	13.6 s
43-Tc-106	6547(11)	35.6 s	55-Cs-142	7308(11)	1.69 s
43-Tc-107	4820(90)	21.2 s	56-Ba-145	5570(110)	4.31 s
51-Sb-132	5509(14)	2.79 min	57-La-143	3425(15)	14.2 min
52-Te-135	5960(90)	19.0 s	57-La-145	4110(80)	24.8 s
53-I-136	6930(50)	83.4 s			

Conclusions

ALL recent decay data libraries have problems with decay heat predictions

MOST are caused by the pandemonium effect - unobserved high energy gamma rays

TAGS can help to fill the gap left by the pandemonium effect