



Update on physics priorities for target R&D GUI meeting, November 13, 2007

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ISOLDE schedule 2007



ISOLDE dates 2007:

protons started April 16 physics started April 20 protons stopped Nov. 12

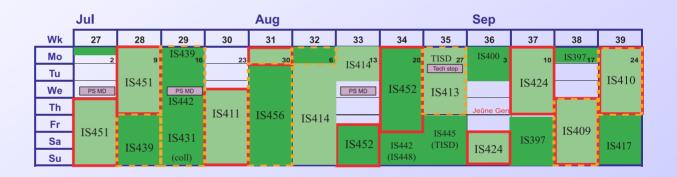
29.5 weeks for physics

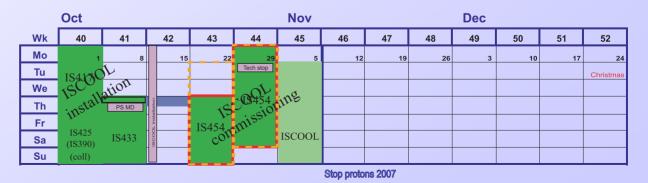
29 experiments (7 REX runs)

 24 target units (3 old units)

12 UC_x targets
 (2 old units)







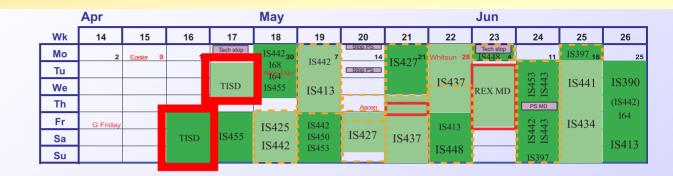


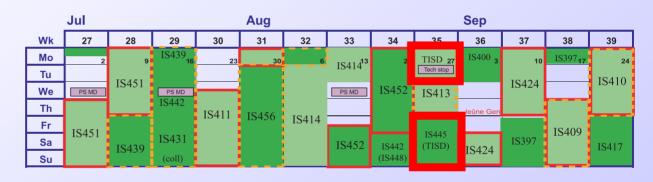
TISD runs in 2007



Four dedicated TISD runs:

- CaO / CP bivalve
- CaO / MiniMono
- HfO / MiniMono
- UCx / q n W RILIS





yield measurements throughout the year





Update of current priority list (I)



PRIORITY 1: Needs by approved experiments.

Target	Beam	Isotopes	Exp.		Time needed	Comments	Online	Offline	Responsi ble	User Exp. Contact	Status
UCx	n-rich Cd		IS393 IS411 IS413	Decay REX ISOLTRAP		Cs and In contaminants. Quartz transfer line		x	Bouquerel	Kratz Krücken Blaum	UNDERWAY (2 nd prototype)
Ta – W	Li	¹¹ Li	IS399	REX		<pre># Test ¹¹Li @ REX # Repetition rate to 100 Hz [ok] # Synchronization # EBIS gases [ok]</pre>	x		REX	Fraile	UNDERWAY ~10 / min ¹¹ Li @ target
ZrO ₂ TiO free	⁶² Ga	⁶² Ga	IS406 (IS413)	ISOLTRAP TAGS		TiO free material to be tested	x		ISOLDE	Herlert	UNDERWAY
UC _x – HP (molecule) ThO – LIS (neutral)	n-rich Te	^{132, 134,} ¹³⁶ Te	IS411 IS415 IS428	REX COMPLIS		# Neutral vs. molecular beam.# RILIS (scheme to be tested)# Quartz transfer [Cs retention].		х	Köster	Kröll Speidel Roussière	UNDERWAY Thermochrom. Te RILIS scheme material
$UC_x - W$ + CF_4	n-rich Ba n-rich Sr		IS411 IS451	REX	Online test	Test BaF ⁺ production and breaking of molecules in REX	х		REX	Krücken Clément	UNDERWAY Test online 2007
UCx	Short lived Ni	°°Ni	IS412	REX ISOLTRAP	2 shifts with IS412	Ni RILIS, Carbon coated target. Also ⁶⁶ Ni implantations Low yields	х		Köster / Catherall	Van Duppen	UNDERWAY
SiC – W	F / AlF - LaF	¹ /F	IS424	REX		LaF+ molecule injection, F+ (stripper foils), AIF+ (+CO ₂ contaminants)	x		Fernandes REX	Woods	UNDERWAY Tested: ~10 ² s ^{-1 17} F @ MINIBALL
Ti foil Si "foil" SiC	n-def. Mg	²² Mg ²³ Mg	IS427 IS413	ISOLTRAP COLLAPS TARGISOL		RILIS tests ^{22}Mg (~10 ⁶ ions/µC for 20 g/cm ² target with ^{22}Na up to 10 ⁸ ions/µC) Si higher cross sections than Ti	x	x	Mainz Köster	Herlert	UNDERWAY COLLAPS [ISOLTRAP ok]
CeO – HP	n-def. Te	¹¹²⁻¹²¹ Te	IS428	COMPLIS		Tested \rightarrow slow unit	x		ISOLDE	Roussière	UNDERWAY
Negative ion sources	Br	⁸² Br, ^{83g} Br	IS431 I59	NICOLE Decay spec.	2/3 weeks	Change of polarities [ok] Comparison of negative sources	х	х	Menna Catherall	Severijns Blank	UNDERWAY Test of new
LaB ₆ MiniMono ion source	I, Cl, At? C beams N, O Noble gases	⁹ C, n- rich C O	IS445 (IS420) (IS413)	Decay REX	GPS Offline test	KENIS, materials Improvement of Ionization efficiency for He, Ne New materials HfO	x	x	Franberg Wenander	Fynbo Jeppesen	materials UNDERWAY Test online 2007
Pb	^{182,184} Hg	^{182,184} Hg	IS452	REX	Online test	Charge breeding successfully tested offline	x	x	Wenander	Butler Van Duppen	UNDERWAY
NiO/Cr ₂ O ₃ / CrC _x	n-def. Mn	⁴ /Mn	P94	Spec.		Release measurements to be performed	х	х	Köster	Jokinen	On hold



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UCx	n-rich Cd		IS393 IS411 IS413	Decay REX ISOLTRAP		Cs and In contaminants. Quartz transfer line		x	Bouquerel	Kratz Krücken Blaum	3rd prototype
Ta – W	Li	¹¹ Li	IS399	REX		# Test ¹¹ Li @ REX # Repetition rate to 100 Hz [ok] # Synchronization # EBIS gases [ok]	x		REX	Fraile	UNDERWAY ~10 / min ¹¹ Li @ target
ZrO ₂ TiO free	⁶² Ga	62Ga	IS406	TAGS		TiO free material to be tested	x		ISOLDE	Herlert	LIST ?
UC _x – HP (molecule) ThO – LIS (neutral)	n-rich Te	^{132, 134,} ¹³⁶ Te	IS411 IS415	REX		# Neutral vs. molecular beam.# RILIS (scheme to be tested)# Quartz transfer [Cs retention].		x	Köster	Kröll Speidel Roussière	L. JERWAY Thermochrom. Te RILIS scheme
$UC_x - W$ + CF_4	n-rich Ba n-rich Sr		IS411 IS451	REX	Online test	Test BaF ⁺ production and breaking of molecules in REX	x		REX	Krücken Clément	test not ok
UCx	Short lived Ni	°°Ni	IS412	REX ISOLTRAP	2 shifts with IS412	Ni RILIS, Carbon coated target. Also ⁶⁶ Ni implantations Low yields	x		Köster / Catherall	Van Duppen	UNDERWAY
SiC – W	F / AlF - LaF	¹ ′F	IS424	REX		LaF+ molecule injection, F+ (stripper foils), AlF+ (+CO ₂ contaminants)	x		Fernandes REX	Woods	1 DONE 7F
Ti foil Si "foil" SiC	n-def. Mg	²² Mg ²³ Mg	IS427 IS413	ISOLTRAP COLLAPS TARGISOL		RILIS tests ^{22}Mg (~10 ⁶ ions/µC for 20 g/cm ² target with ^{22}Na up to 10 ⁸ ions/µC) Si higher cross sections than Ti	x	x	Mainz Köster	Herlert	
CoO - HP	n def Te	112-121 _{To}	18428	COMPLIS		Tested → slow unit					
Negative ion sources	Br	⁸² Br, ^{83g} Br	IS431 I59	NICOLE Decay spec.	2/3 weeks	Change of polarities [ok] Comparison of negative sources	x	x	Menna Catherall	Severijns Blan ^k	eed off-line tes
LaB ₆ MiniMono ion source	I, Cl, At? C beams N, O Noble gases	⁹ C, n- rich C	IS445 (IS420) (IS413)	Decay REX	GPS Offline test	KENIS, materials Improvement of Ionization efficiency for He, Ne New materials HfO	x	x	Franberg Wenander	Fynbo Jeppesen	test failure
Pb	^{182,184} Hg	^{182,184} Hg	IS452	REX	Online test	Charge breeding successfully tested offline	x	x	Wenander	Butler Van Duppen	DONE
NiO/Cr ₂ O ₃ / CrC _x	n-def. Mn	⁴ /Mn	P94	Spec.		Release measurements to be performed	х	х	Köster	Jokinen	On hold





PRIORITY 2: Letters of intent. Improvements for approved experiments.

Target	Beam	Isotopes	Experiment		Time needed	Comments	Online	Offline	Responsi ble	User Exp. Contact	Status
SiC	Al	^{23-20m} Al	I63			SiC and other materials	X	X	Fernandes	Cederkall	UNDERWAY
UC _x – MK5	Ge beams	^{/8,80,82} Ge	158	REX		LoI February 2005 GeS molecules	x	x	REX	Stefanescu	On hold

PRIORITY 3: Research and development.

Target	Beam	Isotopes	Experiment / Request		Time needed	Comments	Online	Offline	Responsi ble	User Exp. Contact	Status
LIST	RILIS		TISD			Alkali suppression + RILIS			Wendt / Fedosseev	—	Underway
Several			TISD	Vibrometer	3 shifts	Stress waves			Wilfinger	—	Underway
Light (MgO) Bi-valve			TISD	EURISOL & ISOLDE		Development of multi transfer line targets	x	х	ISOLDE AB	—	Underway
Various standard	Various	Various	TISD	EURISOL		R&D in the framework of EURISOL-DS	x	x	ISOLDE AB	—	Underway
Negative ion sources	Halogen s et al.	Various	TISD			Development and comparison of negative ion sources		x	Menna	—	Underway
Various			TISD			Studies of nanomaterials		х	ISOLDE AB	_	Underway





PRIORITY 2: Letters of intent. Improvements for approved experiments.

Target	Beam	Isotopes	Experiment		Time needed	Comments	Online	Offline	Responsi ble	User Exp. Contact	Status
SiC	Al	^{23-20m} Al	I63			SiC and other materials	Χ	х	Fernandes	Cederkall	poor yield
UC _x – MK5	Ge beams	^{/8,80,82} Ge	158	REX		LoI February 2005 GeS molecules	x	х	REX	Stefanescu	IS458/P225?

PRIORITY 3: Research and development.

Target	Beam	Isotopes	Experiment / Request		Time needed	Comments	Online	Offline	Responsi ble	User Exp. Contact	Status
LIST	RILIS		TISD			Alkali suppression + RILIS			Wendt / Fedosseev	—	Underway
Several			TISD	Vibrometer	3 shifts	Stress waves			Wilfinger	—	Underway
Light (MgO) Bi-valve			TISD	EURISOL & ISOLDE		Development of multi transfer line targets	x	x	ISOLDE AB	—	Underway
Various standard	Various	Various	TISD	EURISOL		R&D in the framework of EURISOL-DS	x	x	ISOLDE AB	—	Underway
Negative ion sources	Halogen s et al.	Various	TISD			Development and comparison of negative ion sources		x	Menna	—	Underway
Various			TISD			Studies of nanomaterials		х	ISOLDE AB	_	Underway





Priority 1

- **IS451**: SrF+ REX
- **IS452**: Hg REX
- IS413: (Add): ¹⁴O
- P225: Ge/Se beams
- P228: ⁷²Kr [not recommended, but INTC requests high priority]
- **P231**: LIST ⁶²Ga
- **P232**: Fr suppression (Hg/Tl)

Priority 2

- **P230**: Rare earth beams (fluorides) for mass measurements
- **I70**: ⁴⁴Ti

Priority 3

Negative beams (³⁰S) combined with ISCOOL





Priority 1

- IS451: SrF+ REX TESTED (NOT OK)
- IS452: Hg REX DONE
- **IS413**: (Add): ¹⁴O
- IS458: Ge/Se/Sr molecular beams PARTLY TESTED (NOT OK)
- P228: ⁷²Kr [not recommended, but INTC requests high priority]
- IS462: LIST ⁶²Ga
- **IS463**: Fr suppression (Hg/Tl) **TESTED** (UCx quartz) Priority 2

Priority 2

- IS461: Rare earth beams (fluorides) for mass measurements
- **170**: ⁴⁴Ti **UNDERWAY**

Priority 3

• 171: Negative beams (³⁰S) combined with ISCOOL





Priority 1

- IS459/P227: Yield measurement for ^{105,107}Sn
- **IS433**: purification of ³⁵Ar beam (observed large ³⁵Cl contamination during 2007 run with CaO / CP target)
- **IS435**: reduction of ⁷⁵Ga background in ⁷⁵Cu beam
- **IS411**: ¹⁴⁸Ba, reduction of contaminations

Priority 2

- P226: Yield measurement for ¹²⁸Cd
- **I51**: ²²Mg beam, cleaning of ²²Na (+ REX cleaning)

Priority 3

• UC_x target development and temperature controlled transfer (trapping material screening, i.e. other elements to be frozen out)



Accelerator schedule 2008



ISOLDE dates

protons from PSB May 5 physics start ISOLDE May 9 protons stop November 10

(not confirmed yet - changes due to LHC operation possible)

