

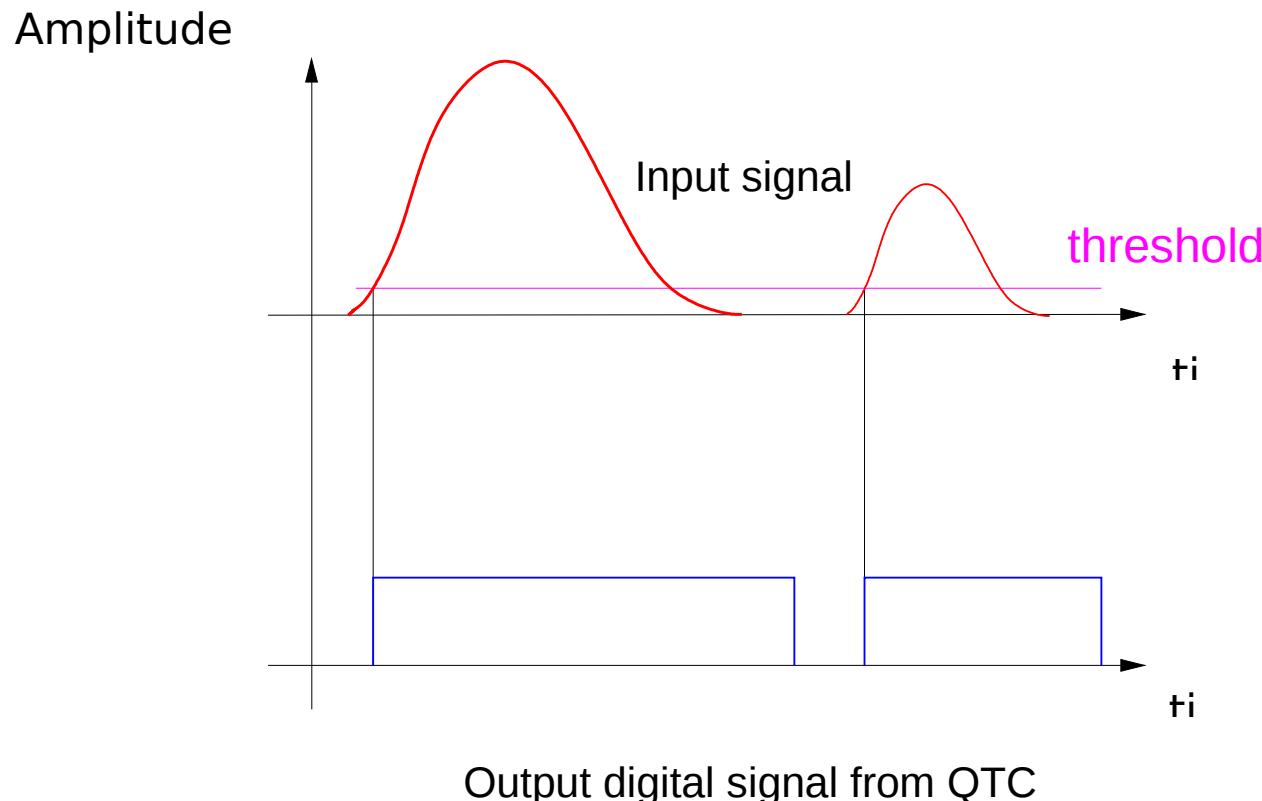
# Data-driven electronics for ILC TPC

## Status report



Alexander Kaukher

# Data-driven Electronics

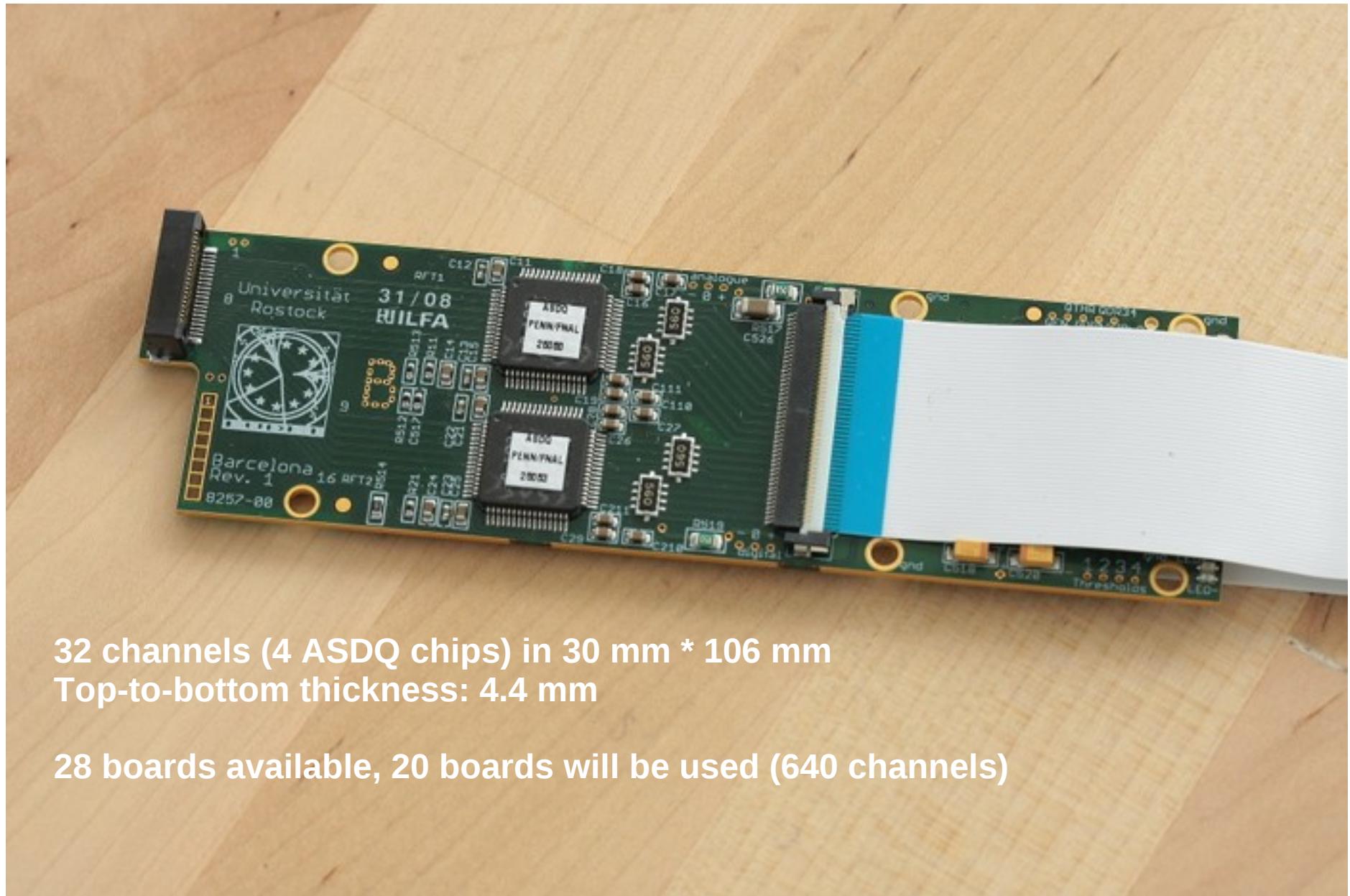


Data zero suppression by analogue data processing.

Here example with threshold timing and charge-to-time conversion.

- The time of arrival is derived using the leading edge discriminator.
- The charge of the input signal is encoded into the width of output digital pulse.

# “Barcelona” Board

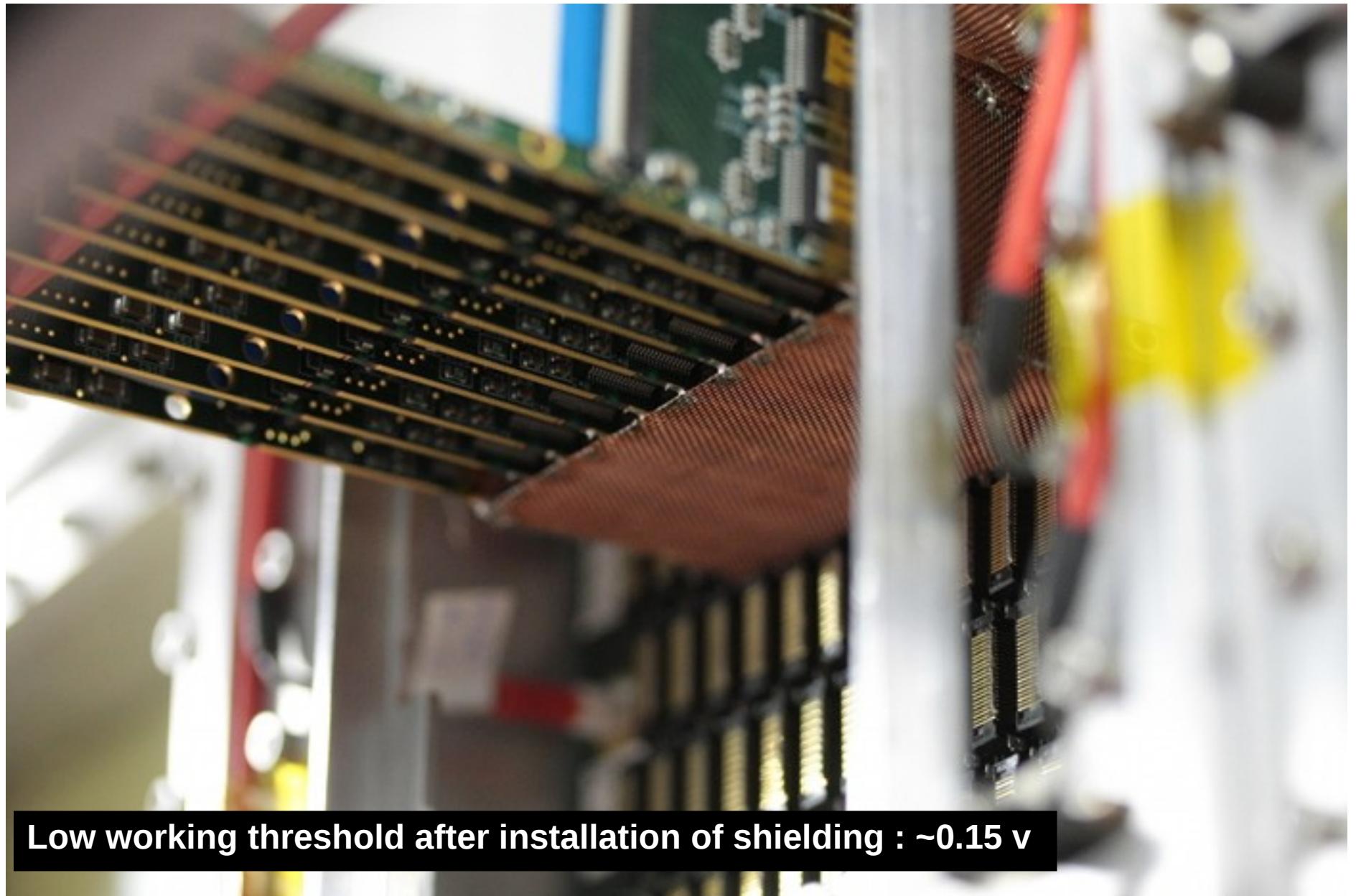


**32 channels (4 ASDQ chips) in 30 mm \* 106 mm**

**Top-to-bottom thickness: 4.4 mm**

**28 boards available, 20 boards will be used (640 channels)**

# Electronics on a GEM Module



Low working threshold after installation of shielding : ~0.15 v

# Electronics on a GEM Module

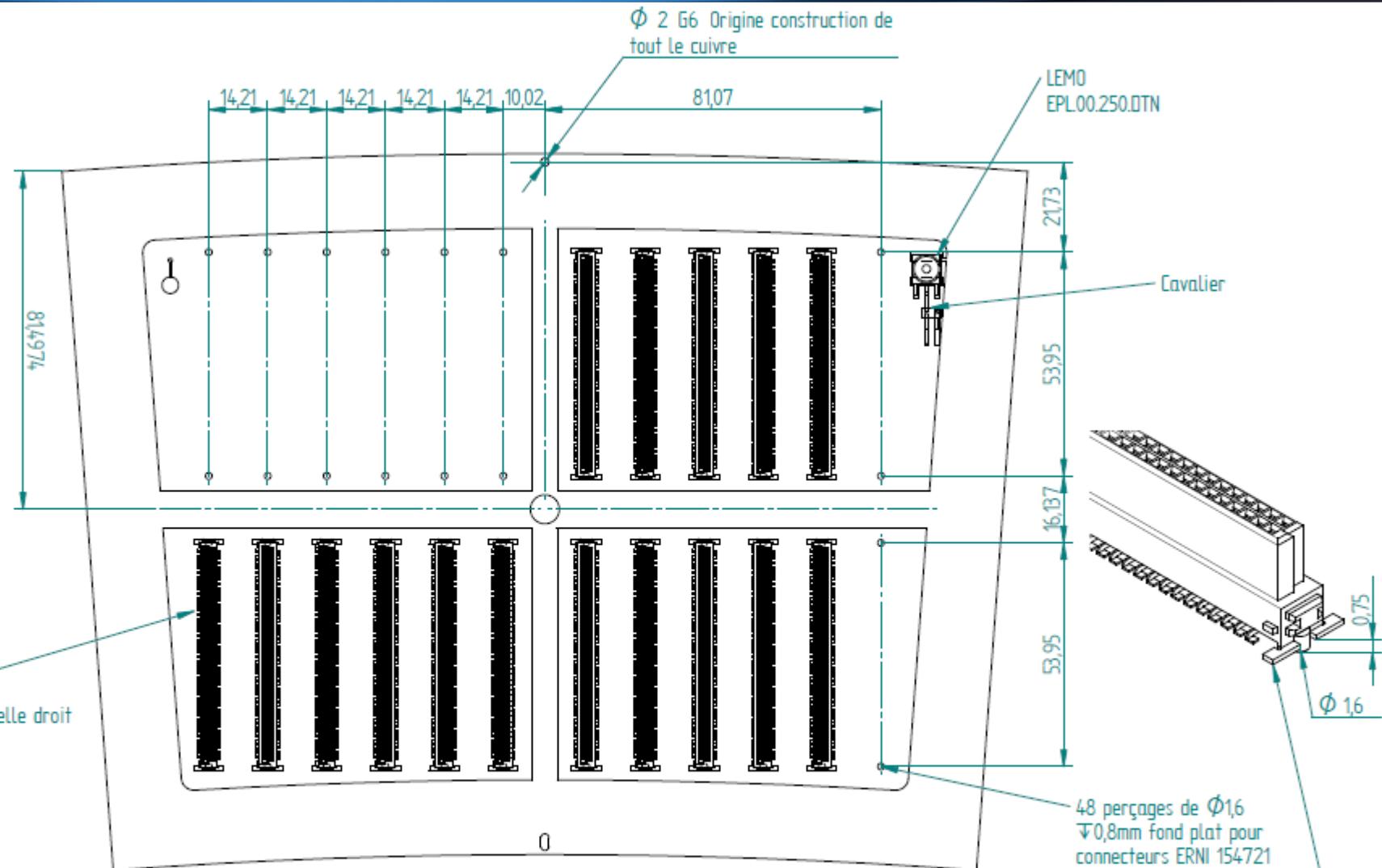


# Complete Setup



# Pads of Micromegas Module

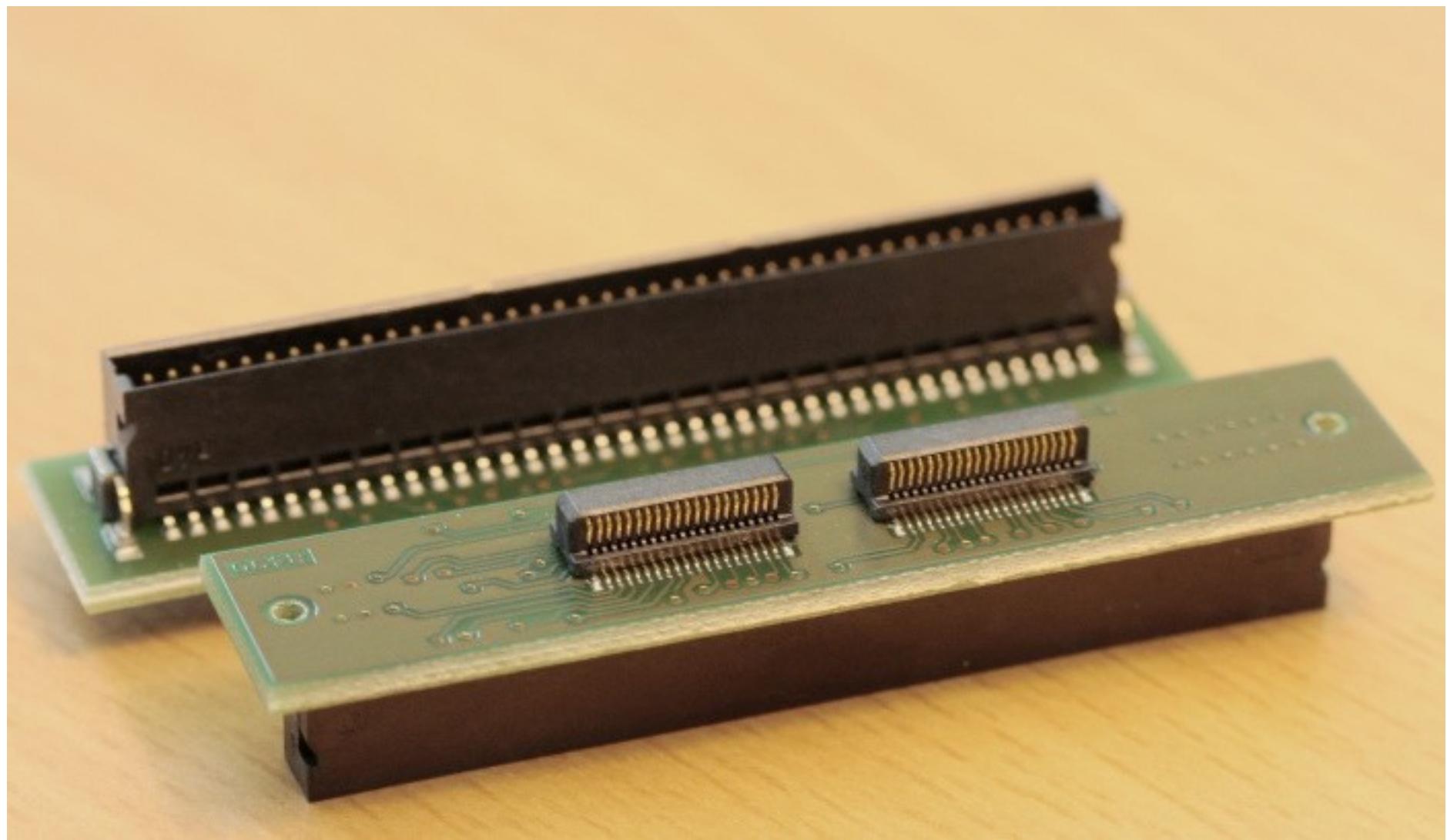
# Connectors of Micromegas Module



Matière:	H:11 js:13	Date :	Dessiné par :	Traitement:
Ech :	h:11 Irg:3,2	08/02/2008	RIALLOT	
Qté :	Titre : Implantation connecteurs			
1,5	Modifié le: 13/03/2008			
	Ide:A	Me:	Etat:R	
Solid Edge	Document LPTPC/2000002			
	C.EA / SACLAY / IRFU / SEDI			
	Plan:	1/1		

SOLID EDGE ACADEMIC COPY

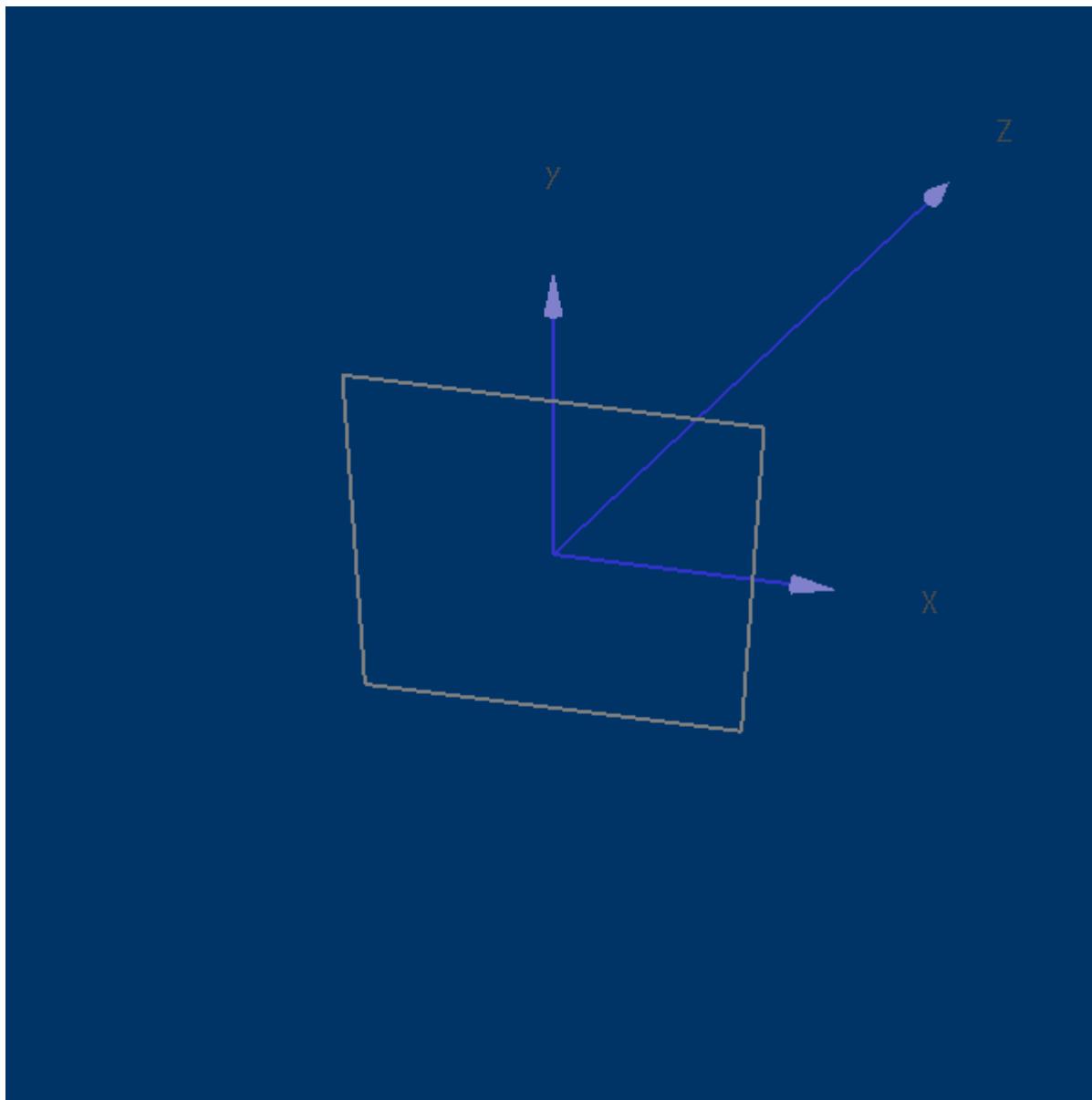
# Adapters for a Micromegas Module



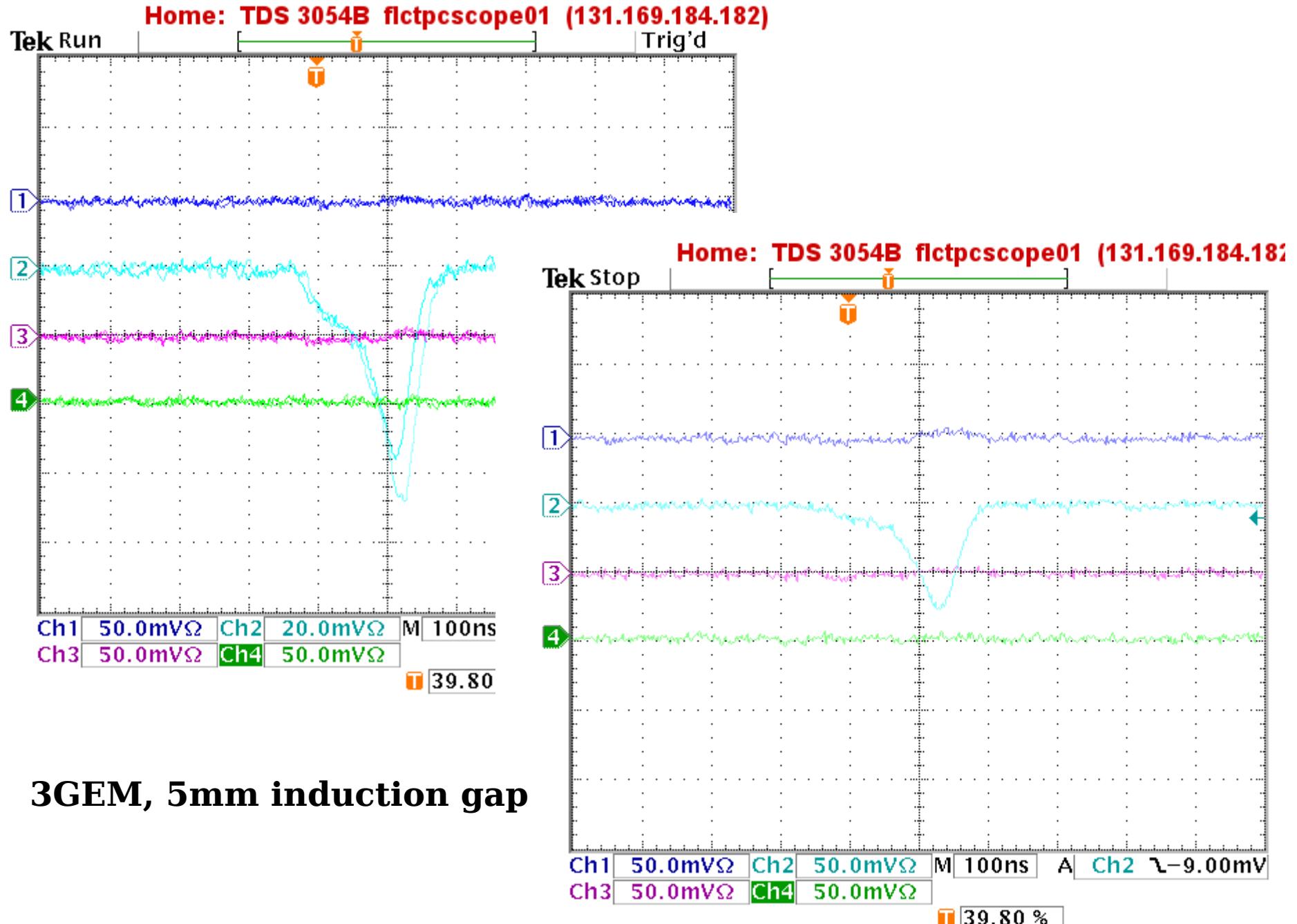
# Pad-map of a Micromegas Module

321	327	330	333	352	365	358	361	364	367	61	58	55	52	49	30	27	24	21	18
337	340	343	346	349	358	371	374	377	380	383	45	42	39	36	33	14	11	8	2
320	323	326	328	332	335	357	360	363	365	62	59	56	53	50	31	28	25	22	19
336	339	342	345	348	351	370	373	376	378	382	16	13	10	37	34	35	12	9	6
322	325	328	331	334	353	356	359	362	365	63	60	57	54	51	48	29	26	23	20
338	341	344	347	350	369	372	375	378	381	47	44	41	38	35	32	13	10	7	4
385	388	391	394	397	416	415	422	425	428	434	125	122	118	116	113	94	88	85	82
401	404	407	410	413	432	435	438	441	444	447	109	106	103	100	97	78	75	72	69
384	387	390	393	396	399	418	414	421	424	427	430	126	123	120	117	114	95	92	89
400	403	406	409	412	415	437	440	443	446	449	110	107	104	101	98	79	76	73	70
386	389	392	395	398	417	420	423	426	429	427	124	124	118	115	112	93	90	87	84
402	405	408	411	414	433	436	439	442	445	448	111	108	105	102	99	76	77	74	71
449	452	455	458	461	480	483	486	489	492	495	189	186	183	180	177	158	155	152	149
465	468	471	474	477	496	499	502	505	508	511	173	170	167	164	161	142	139	136	133
448	451	454	457	460	463	482	485	488	491	494	190	187	184	181	178	159	156	153	150
464	467	470	473	476	479	498	501	504	507	510	174	171	168	165	162	143	140	137	134
459	453	456	459	462	481	484	487	490	493	496	191	188	185	182	179	172	157	154	151
466	469	472	475	478	497	500	503	506	509	515	172	169	166	163	160	141	138	135	132
413	516	519	522	525	541	547	550	553	556	559	253	250	247	244	222	219	216	213	210
529	532	535	538	541	550	563	566	569	572	575	237	234	231	228	225	206	203	200	197
512	515	518	521	524	527	535	549	552	555	558	254	251	248	245	242	223	220	217	214
528	531	534	537	540	543	562	565	568	571	574	238	235	232	229	226	207	204	201	198
514	517	520	523	526	530	547	550	553	556	559	255	252	249	246	243	218	215	212	209
530	533	536	539	542	554	564	567	570	573	576	239	236	233	230	227	224	205	202	199
577	580	583	586	589	608	611	614	617	620	623	317	314	311	308	305	285	283	280	277
593	596	599	602	605	624	627	630	633	636	639	301	298	295	292	289	278	276	274	271
576	579	582	585	588	591	610	613	616	619	622	318	315	312	309	306	287	284	281	278
592	595	598	601	604	607	626	628	632	635	638	302	299	296	293	290	271	268	265	262
578	581	584	587	590	609	612	615	618	621	624	315	312	309	306	303	285	282	279	276
591	597	600	603	605	625	628	631	634	637	639	303	297	294	291	288	269	266	263	260

# 3D “event” Display (CED-based)

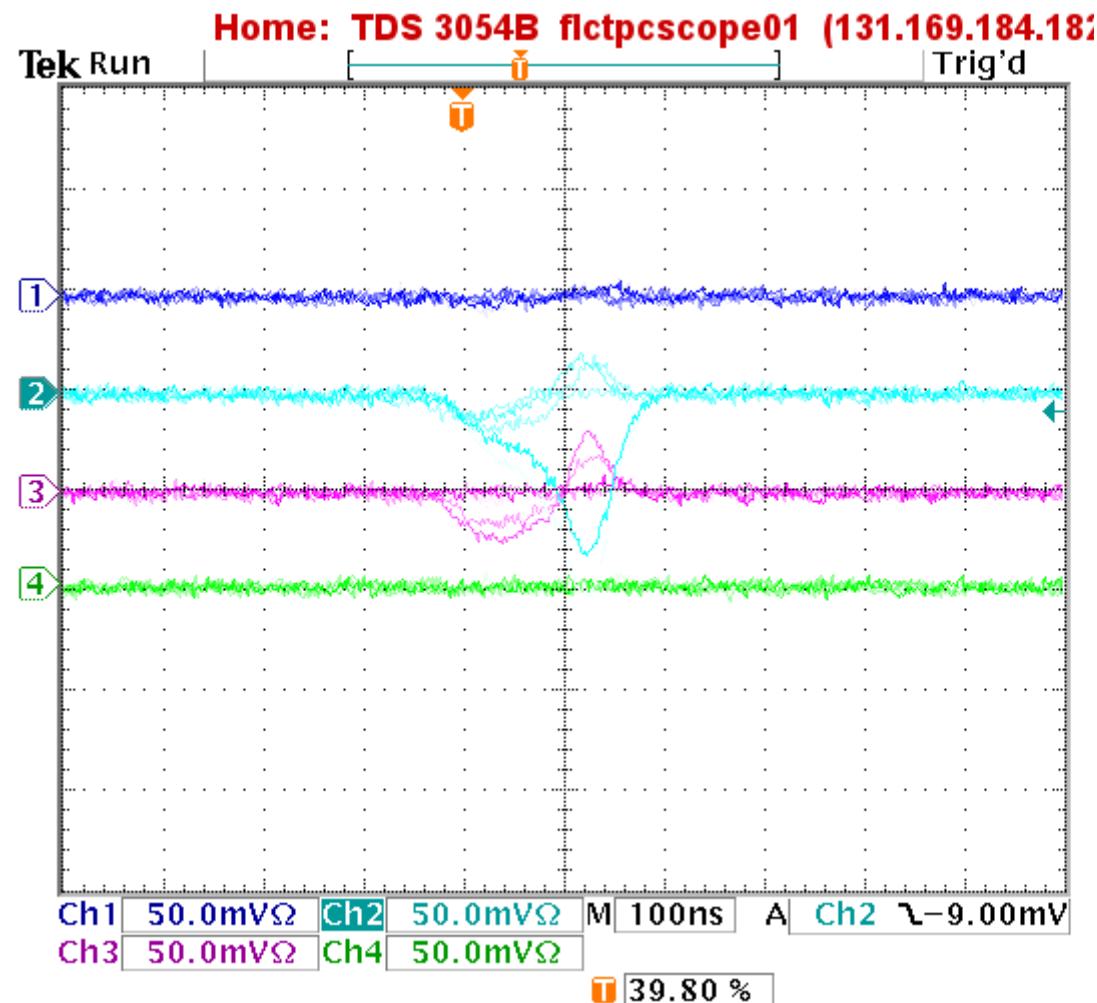


# Signals from a GEM (!) Detector



3GEM, 5mm induction gap

# Signals from a GEM (!) Detector



## Summary and Outlook

No results with JGEM, yet. Higher gas gain would be necessary.  
Currently, VME crate is not prepared to work in B-field.

Micromegas Module will be used next time.  
Higher gas gains possible. Larger area can be covered.

Next step:  
Threshold / efficiency scan  
Charge-to-time conversion parameter (QDR) scan  
Z-scan in LPTPC.

Signal simulation for GEM and Micromegas