

The analysis of data adequacy for Ni 2001.

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Abstract

This note contains results of the analysis for 2001 Ni target data fulfilled on the basis of the logbook, preselected data analysis and processing of data with some additional programs. It includes the list of reliable runs and the list of evens which should be excluded from the analysis and some useful numbers about collected data.

1 Introduction

The aim of this work was to reject unreliable data from the future analysis and to collect important information about setup performance in one place.

The electronic logbook written at the data taken (pcdirac06) has been used as initial point. From this file the run numbers, the target type, the exact data of run start and the trigger type were extracted into the spreadsheet. Then, on the base of analysis of the paper logbook the column with extraction of shift comments was added. Another source of information was log-files obtained on the preselection stage. From the log-files the Drift Chambers efficiency, the global tracks efficiency, the relative numbers of “good evens” selection, and the number of events in ntuples were taken. On the base of data supplied by Main Control Room the proton flux for each run was calculated. The last source of information was the results of processing data with special program which defines nonworking channels of Scintillating Fiber, Ionization Hodoscope, Drift Chambers, Vertical Horizontal Hodoscopes, Cherenkov, Preshower and Muon detectors during run.

Next two items of this note present results about the total statistic for Ni 2001 data and the list reliable runs and unreliable parts of these runs which should be excluded from analysis.

2 Number of triggers, proton flux etc.

This item contains some more important numbers and data about Ni 2001.

Target	Ni
Thickness	94 μm ($\pm 2 \mu\text{m}$) and 97.7 μm ($\pm 1 \mu\text{m}$)
$N_{\text{runs T4}}$	515 (381 with 94 μm and 134 with 97.7 μm)
$N_{\text{runs T1}}$	48 (not processed yet and not taken into account in below data)
N_{subruns}	3664
$N_{\text{triggers all}}$	775 10^6
$N_{\text{triggers } \pi\pi}$	638 10^6

$N_{\text{preselected triggers}}$	$40 \cdot 10^6$	
$N_{\text{ntuple entrances}}$	$10 \cdot 10^6$	
N_{spills}	1120758	(~ 2.5 spill/scycle, $t_{\text{spill}}=400$ ms)
Data taking time	119 days	(June 17, 2001 – Oct 13, 2001)
Average Intensity in T8		$= 5.0 \div 8.5 \cdot 10^{10}$ protons/spill
Full proton flux = $N_{\text{spills}} \times \text{Int/spill}$		$= 8.4 \cdot 10^{16}$ protons
Number of proton Ni interactions		$= 5.5 \cdot 10^{13}$

Preselected events placed at CASTOR storage system in directory:
[/castor.cern.ch/dirac/rawdata/goods/Ni2001/good](http://castor.cern.ch/dirac/rawdata/goods/Ni2001/good)

Ntuples placed at:
[/afs.cern.ch/exp/dirac/production1/Ni2001/nt](http://afs.cern.ch/exp/dirac/production1/Ni2001/nt)

Initial run number 3445.

Last run number 4301.

New Ionization Hodoscope was installed at the very beginning of data taking.

New Ni target was installed before run 4073.

New thresholds for Drift Chambers were set before run 3841

MSGC-2 removed from beam line before run 4262

3 List of “certified” runs

Below you can find the list of runs recommended for all type of analysis.

3456	3459	3461	3462	3464	3465	3467	3468	3470	3471
3473	3475	3477	3478	3480	3481	3482	3483	3484	3486
3487	3489	3491	3493	3494	3496	3497	3498	3500	3502
3504	3505	3507	3508	3510	3511	3513	3514	3521	3522
3524	3526	3527	3528	3531	3534	3536	3538	3539	3540
3541	3543	3545	3546	3547	3548	3550	3551	3552	3555
3556	3558	3559	3561	3562	3564	3566	3568	3569	3571
3574	3575	3577	3578	3580	3582	3584	3585	3587	3588
3590	3591	3592	3594	3595	3598	3599	3600	3601	3605
3606	3609	3610	3612	3613	3614	3615	3617	3618	3619
3621	3622	3623	3625	3626	3628	3629	3632	3633	3635
3636	3637	3638	3640	3641	3643	3644	3645	3646	3648
3649	3651	3654	3657	3659	3660	3661	3662	3663	3664
3665	3667	3669	3670	3671	3672	3674	3675	3678	3679
3681	3682	3684	3685	3686	3687	3689	3690	3693	3694
3696	3697	3699	3702	3704	3705	3706	3708	3709	3710
3711	3713	3715	3717	3718	3720	3721	3723	3725	3726
3728	3729	3730	3733	3734	3736	3737	3741	3742	3746
3747	3749	3750	3756	3757	3758	3760	3764	3765	3766
3768	3769	3771	3774	3778	3779	3781	3783	3784	3785
3788	3790	3791	3792	3794	3796	3797	3799	3802	3804
3805	3806	3807	3808	3809	3811	3812	3813	3814	3817
3818	3821	3822	3824	3825	3826	3828	3829	3830	3832
3834	3835	3836	3838	3839	3842	3843	3845	3846	3847
3850	3851	3853	3854	3855	3857	3858	3862	3865	3866
3867	3869	3871	3872	3873	3875	3876	3877	3879	3881
3882	3884	3885	3888	3889	3891	3892	3893	3895	3896
3897	3899	3900	3902	3903	3904	3906	3907	3910	3911
3913	3914	3916	3917	3919	3924	3925	3927	3928	3929
3931	3932	3934	3935	3937	3938	3939	3941	3942	3943
3945	3947	3949	3950	3952	3953	3954	3956	3957	3958
3962	3963	3965	3966	3967	3969	3970	3972	3973	3975
3978	3979	3981	3982	3984	3986	3987	3988	3990	3991
3993	3994	3996	3997	3998	3999	4001	4002	4004	4005
4007	4008	4009	4010	4015	4017	4018	4020	4021	4023
4024	4025	4026	4028	4029	4030	4032	4034	4037	4039

4040	4041	4043	4045	4046	4047	4048	4050	4052	4053
4054	4056	4057	4059	4060	4064	4065	4067	4069	4070
4072	4075	4077	4086	4088	4089	4091	4092	4095	4096
4098	4099	4100	4102	4104	4106	4107	4109	4111	4113
4114	4116	4118	4123	4125	4127	4129	4131	4134	4136
4137	4139	4141	4142	4144	4146	4147	4149	4150	4152
4153	4155	4156	4157	4158	4159	4161	4163	4164	4165
4167	4168	4171	4172	4173	4175	4177	4178	4179	4181
4183	4184	4186	4187	4188	4190	4191	4194	4196	4198
4199	4200	4201	4203	4205	4207	4208	4210	4211	4212
4215	4216	4219	4220	4222	4223	4225	4226	4227	4228
4230	4231	4233	4234	4236	4238	4240	4244	4245	4247
4249	4250	4251	4253	4254	4255	4257	4258	4260	4261
4264	4266	4267	4268	4269	4271	4273	4274	4276	4277
4280	4281	4284	4285	4287	4288	4290	4291	4292	4293
4295	4296	4299	4300	4301					

Part of this runs contain unreliable data, mainly when part of channels for some detectors did not work properly. More often it happens with slabs 1-8 of the Vertical Hodoscope and one of fore planes of the Ionization Hodoscope. It is possible to use the UNIX time for cutting out of this data from processed one. The simple logical operator for this looks like:

```

LowUtime=1
HighUtime=2147483647
if (RunN.eq.3465.and.(UxTm.gt. 992961534.and.UxTm.lt. 992965479)
# .or.RunN.eq.3494.and.(UxTm.gt. 993223915.and.UxTm.lt. 993223987)
# .or.RunN.eq.3500.and.(UxTm.gt. 993283873.and.UxTm.lt. 993286009)
# .or.RunN.eq.3502.and.(UxTm.gt. LowUtime. and.UxTm.lt. 993294843)
# .or.RunN.eq.3514.and.(UxTm.gt. 993397107.and.UxTm.lt. 993397189)
# .or.RunN.eq.3524.and.(UxTm.gt. 993460407.and.UxTm.lt. HighUtime)
# .or.RunN.eq.3528.and.(UxTm.gt. 993490631.and.UxTm.lt. HighUtime)
# .or.RunN.eq.3550.and.(UxTm.gt. 993663276.and.UxTm.lt. 993665049)
# .or.RunN.eq.3552.and.(UxTm.gt. 993688874.and.UxTm.lt. 993689882)
# .or.RunN.eq.3578.and.(UxTm.gt. 993949103.and.UxTm.lt. 993953552)
# .or.RunN.eq.3612.and.(UxTm.gt. 994247117.and.UxTm.lt. 994251450)
# .or.RunN.eq.3621.and.(UxTm.gt. 994338165.and.UxTm.lt. 994339137)
# .or.RunN.eq.3637.and.(UxTm.gt. 994503813.and.UxTm.lt. 994505856)
# .or.RunN.eq.3685.and.(UxTm.gt. 994979887.and.UxTm.lt. 994992689)
# .or.RunN.eq.3741.and.(UxTm.gt. 995566205.and.UxTm.lt. 995567496)
# .or.RunN.eq.3749.and.(UxTm.gt. 995617776.and.UxTm.lt. 995618918)
# .or.RunN.eq.3792.and.(UxTm.gt. 995983478.and.UxTm.lt. HighUtime)
# .or.RunN.eq.3794.and.(UxTm.gt. 995993585.and.UxTm.lt. 995993748)
# .or.RunN.eq.3825.and.(UxTm.gt. 996332083.and.UxTm.lt. 996332150)
# .or.RunN.eq.3869.and.(UxTm.gt. 996825350.and.UxTm.lt. 996829569)
# .or.RunN.eq.3873.and.(UxTm.gt. 996854498.and.UxTm.lt. 996855240)
# .or.RunN.eq.3938.and.(UxTm.gt. 997523508.and.UxTm.lt. 997527072)
# .or.RunN.eq.3949.and.(UxTm.gt. 997642200.and.UxTm.lt. 997644084)
# .or.RunN.eq.3956.and.(UxTm.gt. 997701302.and.UxTm.lt. 997703503)
# .or.RunN.eq.3965.and.(UxTm.gt. 997785000.and.UxTm.lt. HighUtime)
# .or.RunN.eq.3979.and.(UxTm.gt. 997893683.and.UxTm.lt. 997893999)
# .or.RunN.eq.4029.and.(UxTm.gt. 998338593.and.UxTm.lt. 998338949)
# .or.RunN.eq.4043.and.(UxTm.gt. 998534147.and.UxTm.lt. 998548361)
# .or.RunN.eq.4045.and.(UxTm.gt. 998565192.and.UxTm.lt. 998568533)
# .or.RunN.eq.4046.and.(UxTm.gt. 998581622.and.UxTm.lt. 998582057)
# .or.RunN.eq.4047.and.(UxTm.gt. 998584008.and.UxTm.lt. 998584056)
# .or.RunN.eq.4048.and.(UxTm.gt. 998601985.and.UxTm.lt. 998602287)
# .or.RunN.eq.4052.and.(UxTm.gt. 998639399.and.UxTm.lt. 998640709)
# .or.RunN.eq.4052.and.(UxTm.gt. 998643179.and.UxTm.lt. 998644743)
# .or.RunN.eq.4052.and.(UxTm.gt. 998645363.and.UxTm.lt. 998645533)
# .or.RunN.eq.4053.and.(UxTm.gt. 998650655.and.UxTm.lt. 998653880)
# .or.RunN.eq.4053.and.(UxTm.gt. 998655428.and.UxTm.lt. 998659292)

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# .or.RunN.eq.4075.and.(UxTm.gt.1000800992.and.UxTm.lt.1000802979)
# .or.RunN.eq.4075.and.(UxTm.gt.1000802792.and.UxTm.lt.1000803147)
# .or.RunN.eq.4077.and.(UxTm.gt.1000816671.and.UxTm.lt.1000817792)
# .or.RunN.eq.4086.and.(UxTm.gt.1000852182.and.UxTm.lt.1000857308)
# .or.RunN.eq.4098.and.(UxTm.gt.1000955809.and.UxTm.lt.1000958209)
# .or.RunN.eq.4102.and.(UxTm.gt.1000991269.and.UxTm.lt.1000994646)
# .or.RunN.eq.4127.and.(UxTm.gt.1001207939.and.UxTm.lt.1001211651)
# .or.RunN.eq.4129.and.(UxTm.gt.1001222135.and.UxTm.lt.1001223008)
# .or.RunN.eq.4152.and.(UxTm.gt.1001417286.and.UxTm.lt.1001417991)
# .or.RunN.eq.4157.and.(UxTm.gt.1001465622.and.UxTm.lt.1001465751)
# .or.RunN.eq.4164.and.(UxTm.gt.1001555843.and.UxTm.lt.1001557271)
# .or.RunN.eq.4168.and.(UxTm.gt.1001600291.and.UxTm.lt.1001604392)
# .or.RunN.eq.4194.and.(UxTm.gt.1001843007.and.UxTm.lt.1001846483)
# .or.RunN.eq.4264.and.(UxTm.gt.1002566955.and.UxTm.lt.1002567068)
# .or.RunN.eq.4268.and.(UxTm.gt.1002611691.and.UxTm.lt.1002611761)
# .or.RunN.eq.4281.and.(UxTm.gt.1002754549.and.UxTm.lt.1002756097)
# .or.RunN.eq.4284.and.(UxTm.gt. LowUtime.and.UxTm.lt.1002762529)
# .or.RunN.eq.4296.and.(UxTm.gt.1002893199.and.UxTm.lt.1002893223)
# ) then
c
c     User code for rejected
c
c     else
c
c     User code for accepted
c
c     endif

```

For standard set of ntuples this job was done and directory:

`/afs/cern.ch/exp/dirac/production1/Ni2001/nt_links`

contains now ntuples with cleaned bad events as for standard set of preselected events, so named “good” runs placed on castor.

`/castor/cern.ch/dirac/rawdata/goods/Ni2001/good`

For all other data this cut have not been applied.

4 About “Universal” logbook

The detailed information about all Ni2001 runs is available at:

`/afs/cern.ch/user/d/diracww/public/www/processing/
ni2001/UniversalLOGbookNi2001.pdf`

There are two more useful files in this directory:

`ni2001good.list` – list of “certified” runs
`clear.template` – list of events which should be removed

Comments, suggestions and criticism (constructive one) are welcome to E-mail: valeri.brekhovskikh@cern.ch