Example of TEQC mulitpah results

LKB

12th January 2016

NGI

Introduction

Introductory notes

TEQC tutorial can be found at:
`http://www.unavco.org/software/data-processing/TEQC/doc/UNAVCO_TEQC_Tutorial.pdf`
TEQC website is at:
`http://www.unavco.org/software/data-processing/TEQC/TEQC.html`

TEQC can be downloaded from:
`http://www.unavco.org/software/data-processing/TEQC/development/TEQC_mingw_64.zip` (x64 - 64 bit Windows)
`http://www.unavco.org/software/data-processing/TEQC/development/TEQC_mingw_32.zip` (32 bit Windows)

Support files

Following files can be found at H24VLP Moodle website (`http://moodle.nottingham.ac.uk/course/view.php?id=26398`):

TEQC_intro.pdf TEQC introductory document by Sean Ince;

MP_TEQC.pdf This presentation;

extractRinex4Msc.bat Script (batch file) for RINEX extraction and TEQC QC analysis required for the practical;

extractMPdata.bat Script to convert COMPACT2 format to csv file readable by Excel. See following slide for details.

ExtractSNR.py Python script, part of extractMPdata.bat;

2006_Ogaja.pdf A paper discussing multipath analysis' in Matlab using TEQC QC output;

Matlab.zip Matlab script, discussed in the paper above. Use *main.m* to run it.

How to use my script I

To use *extractMPdata.bat*, script to convert COMPACT2 format to csv file readable by Excel, you need to:

- copy both extractMPdata.bat and ExtractSNR.py to same folder
- install python 2.7.x (`https://www.python.org/downloads/release/python-279/`
- install GPSToolkit (`(http://www.gpstk.org`)
- add GPSToolkit to your PATH.
  - PATH will be under User variables
  - append `;PATH\TO\GPSToolkit\bin` the end of the PATH variable.

How to use my script II

- Go to COMPUTER→PROPERTIES→Advanced Properties→Environmental Variable
- **DON'T OVERWRITE ORIGINAL PATH variable !!!**

- run extractMPdata.bat in the same folder as TEQC QC output

Workflow

In order to obtain multipath characteristics please follow those steps:

- Convert data to RINEX using TEQC (see my batch file or Sean's introduction);
- Extract QC characteristics (TEQC +qc obs file.15o or see my batch file);
- Examine mp1 and mp2 files (using my python script for example);
- Plot results, for example in Excel;
- *Use Ogaja Matlab script for additional analysis and visual representation of results;*
- **Analyse data and draw conclusions.**

Multipath Test

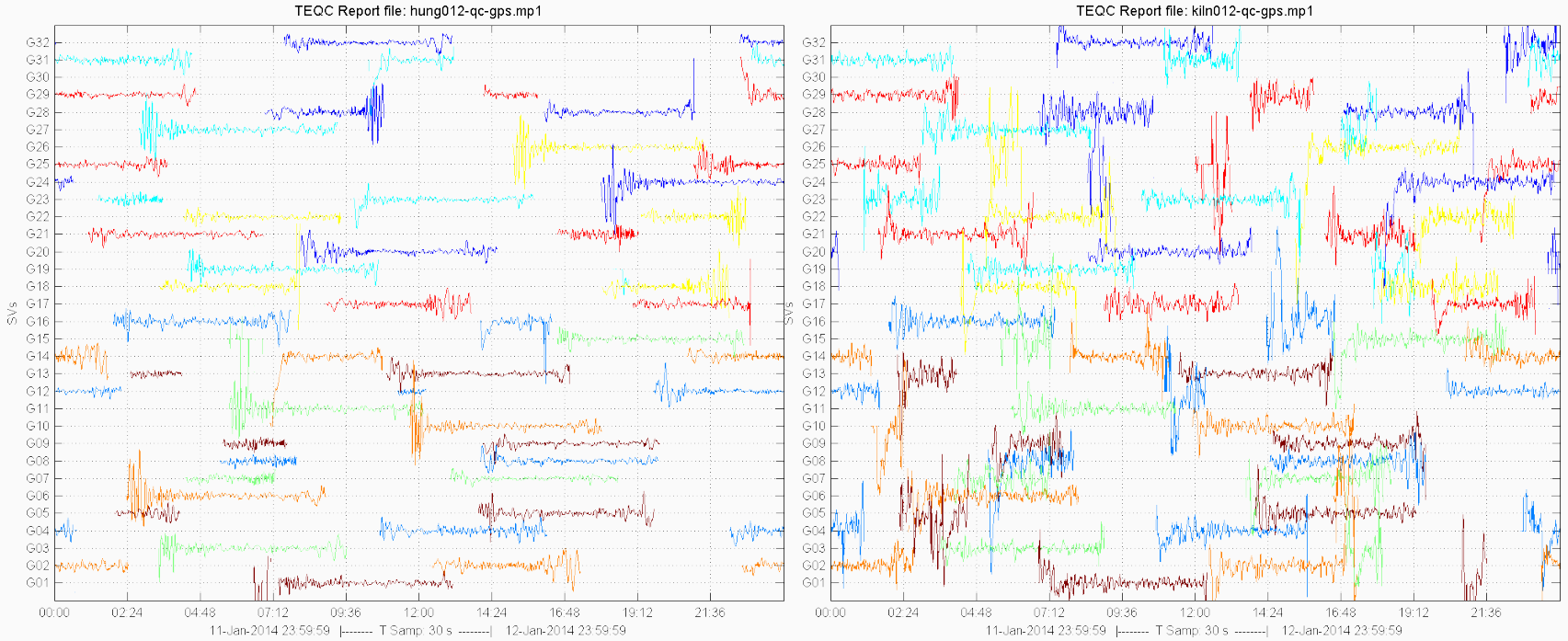
ID	$E[m]$	$N[m]$	Ht Ort [m][a]	Notes
JUB7	454 729.552	339 338.900	28.980	Open Space
JUB8	454 682.344	339 523.094	27.803	Trees
JUB9	454 849.211	339 695.876	29.905	MP for Group 1
JUB10	454 851.667	339 697.291	29.866	MP for Group 2

Table 1: *OSGB coordinates for the Project 1*

[a] Geoid undulation is 48.523m

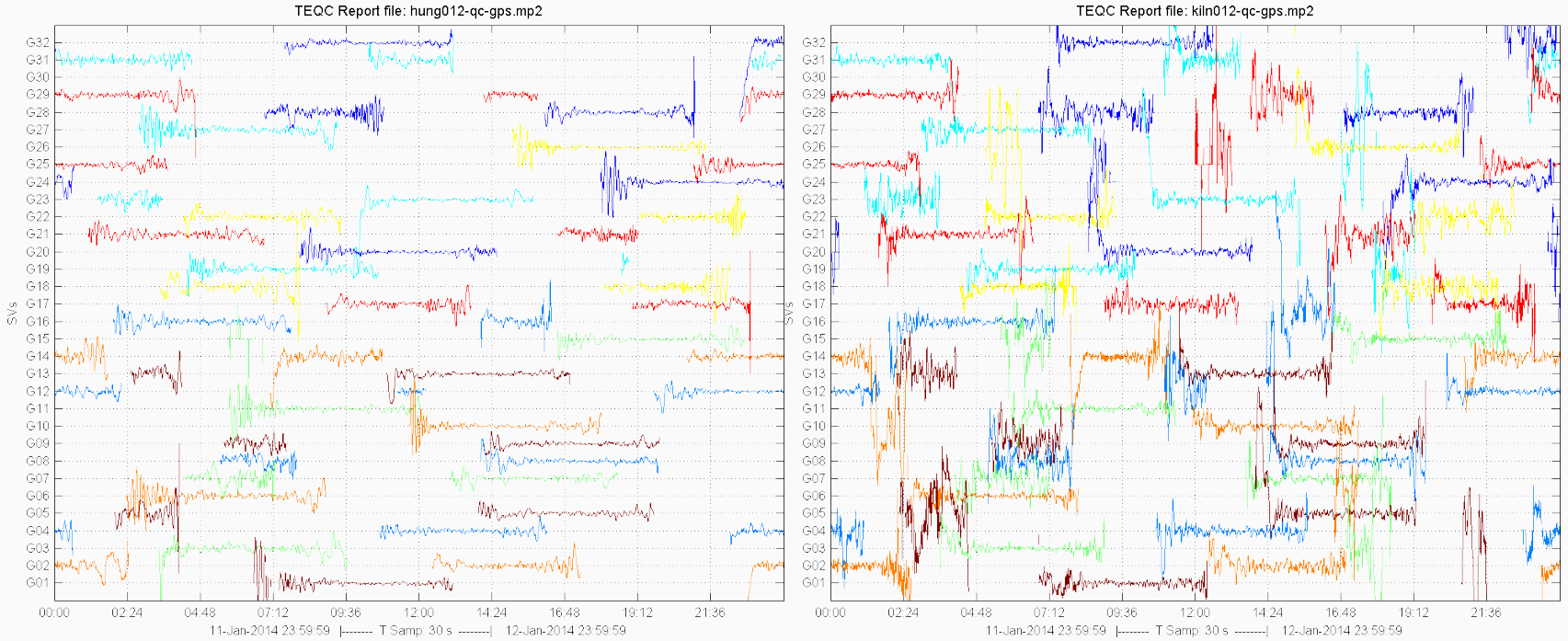
Comparison examples

Monday 12/01/15, MP1



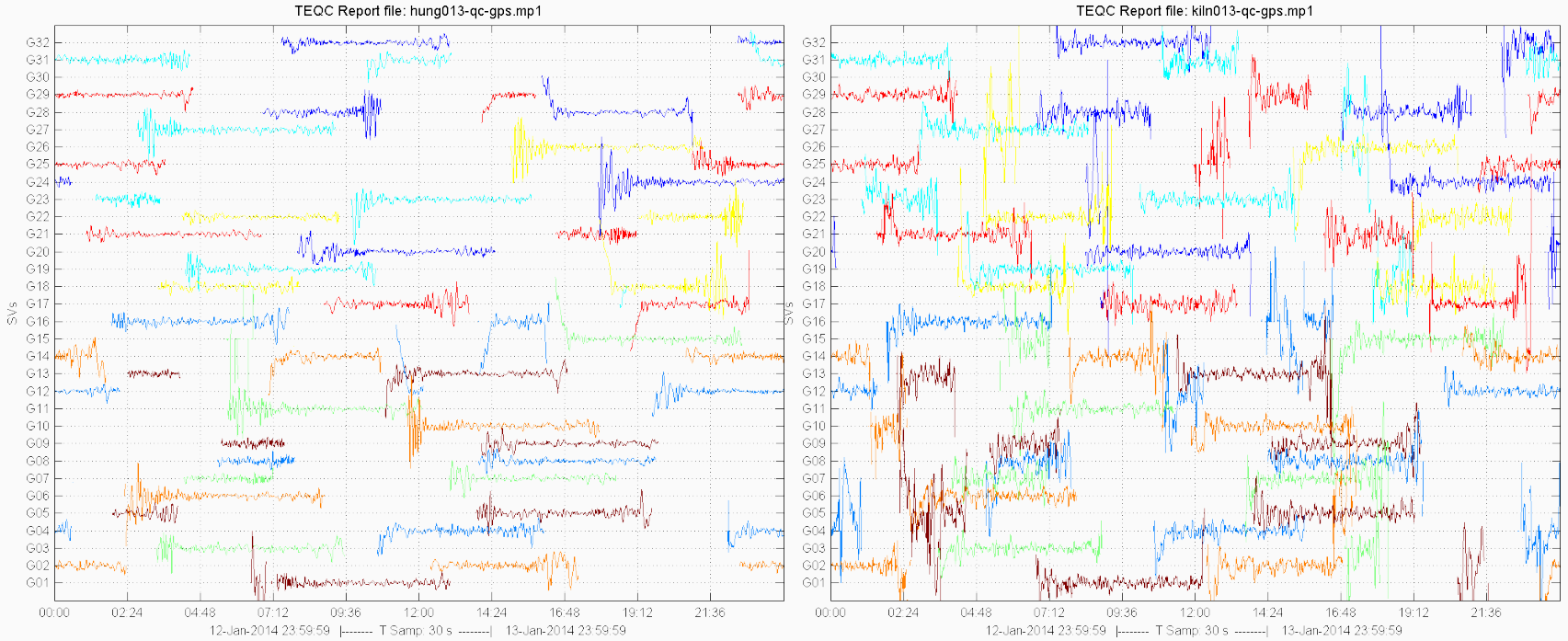
(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

Figure 1: *Comparison of TEQC MP1 outputs*



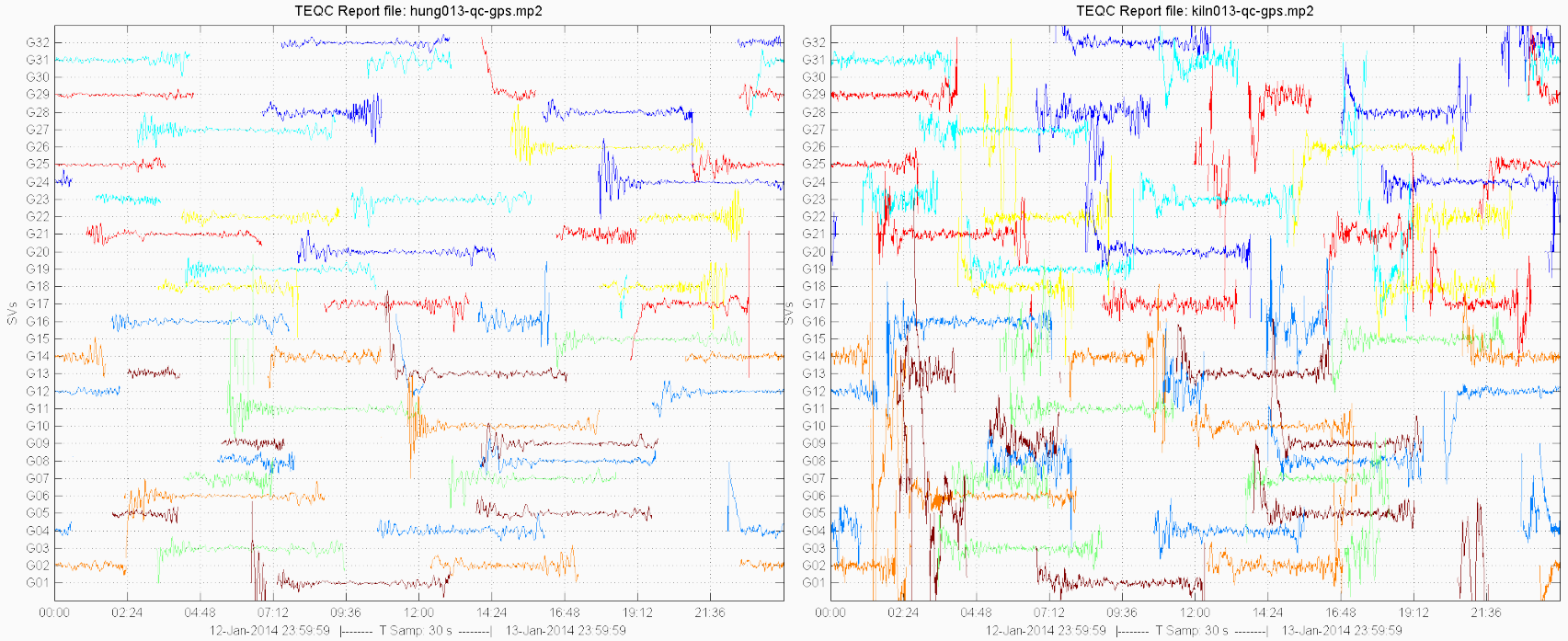
(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

Figure 2: *Comparison of TEQC MP2 outputs*



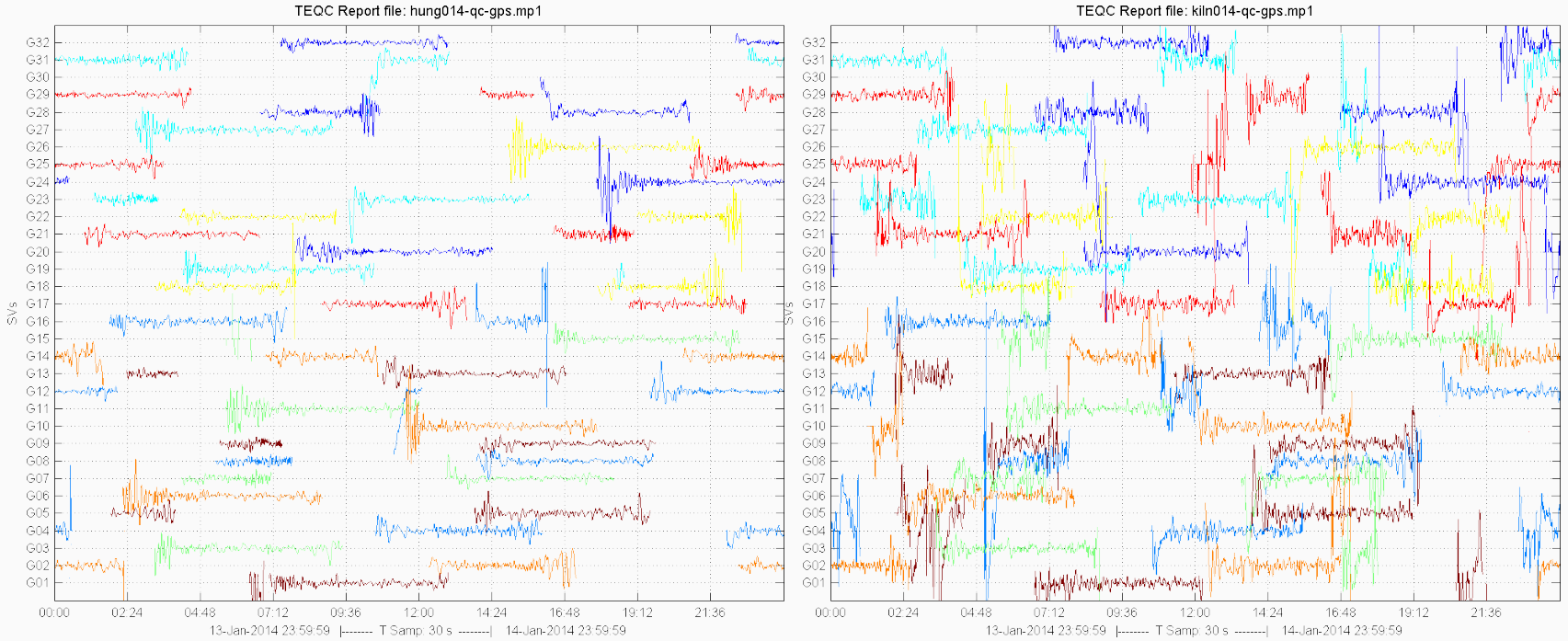
(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

Figure 3: *Comparison of TEQC MP1 outputs*



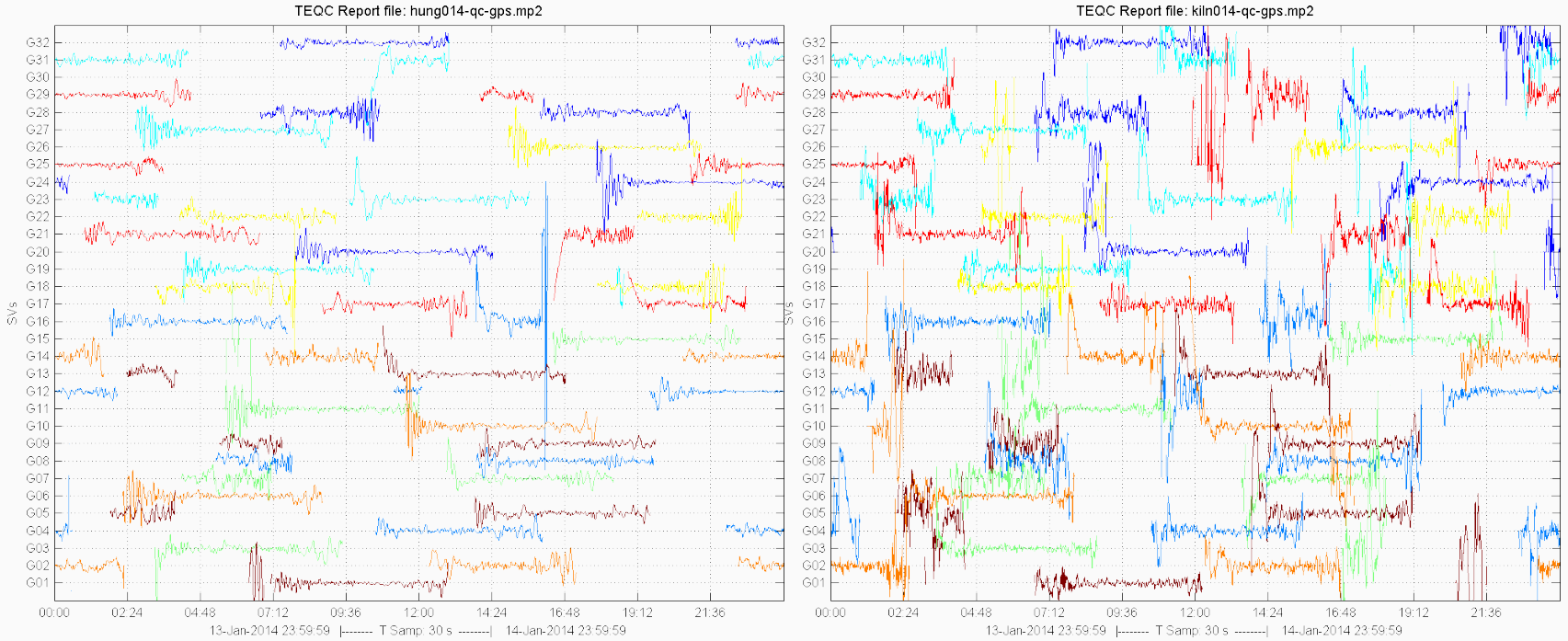
(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

Figure 4: *Comparison of TEQC MP2 outputs*



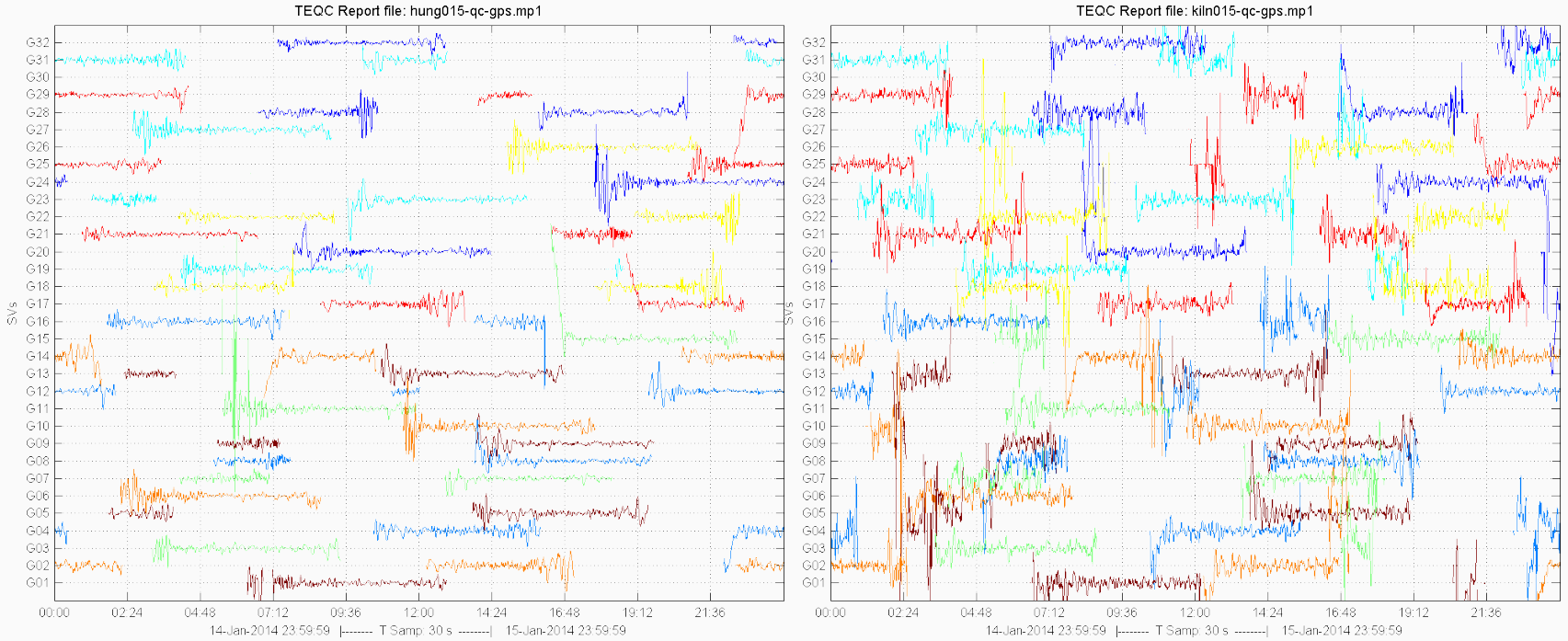
(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

Figure 5: *Comparison of TEQC MP1 outputs*



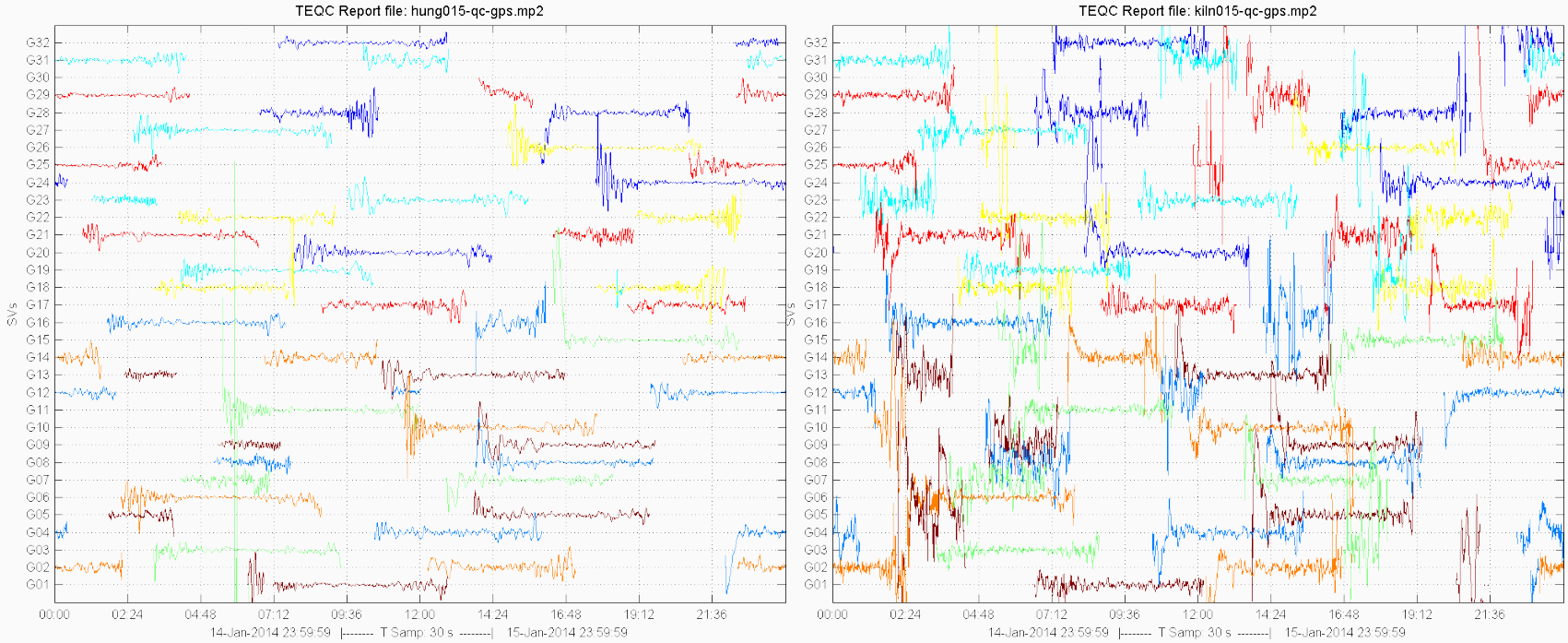
(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

Figure 6: *Comparison of TEQC MP2 outputs*



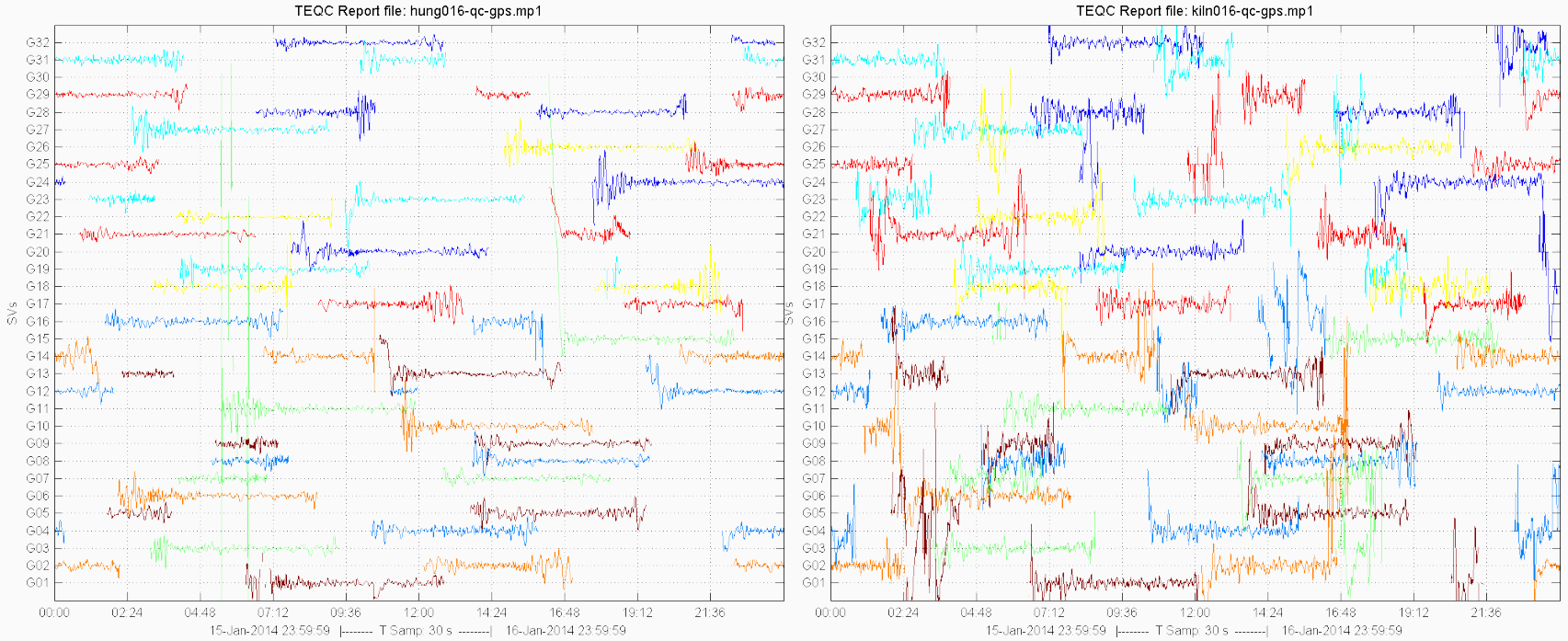
(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

Figure 7: *Comparison of TEQC MP1 outputs*



(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

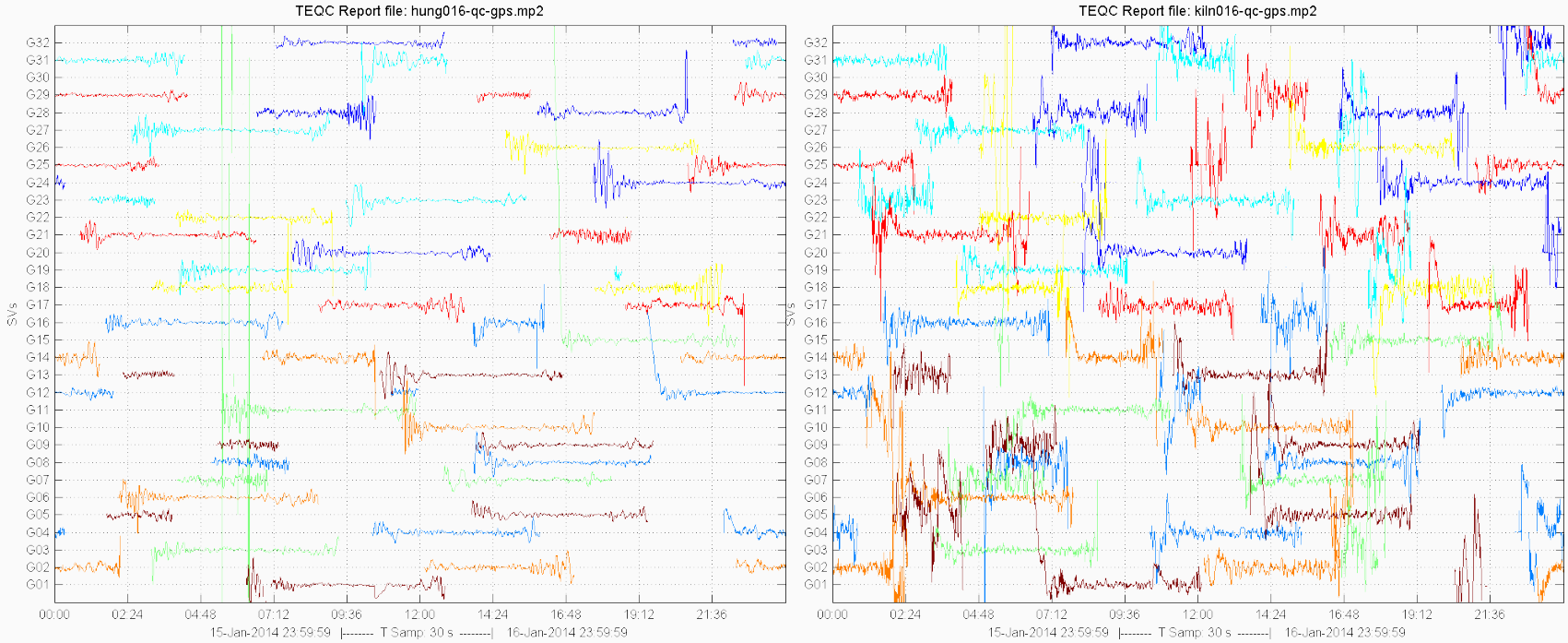
Figure 8: *Comparison of TEQC MP2 outputs*



(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

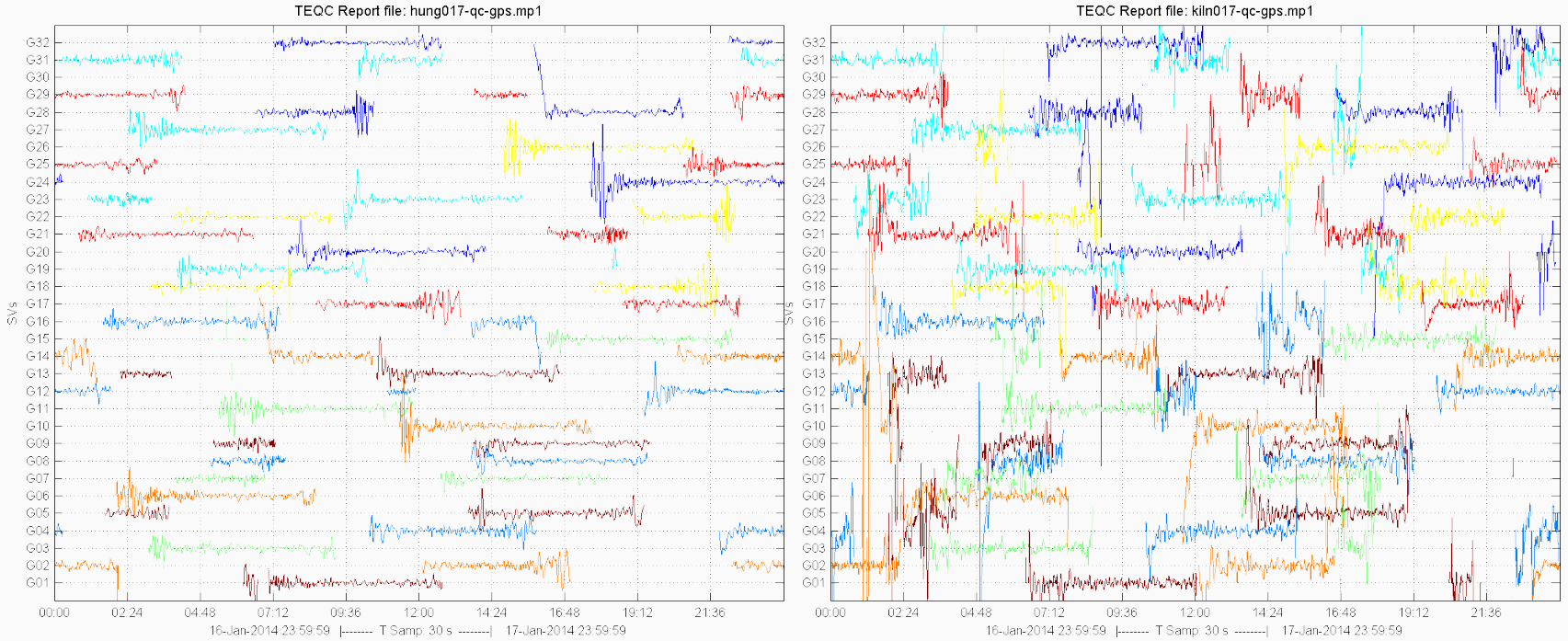
Figure 9: *Comparison of TEQC MP1 outputs*

Friday 16/01/15, MP2



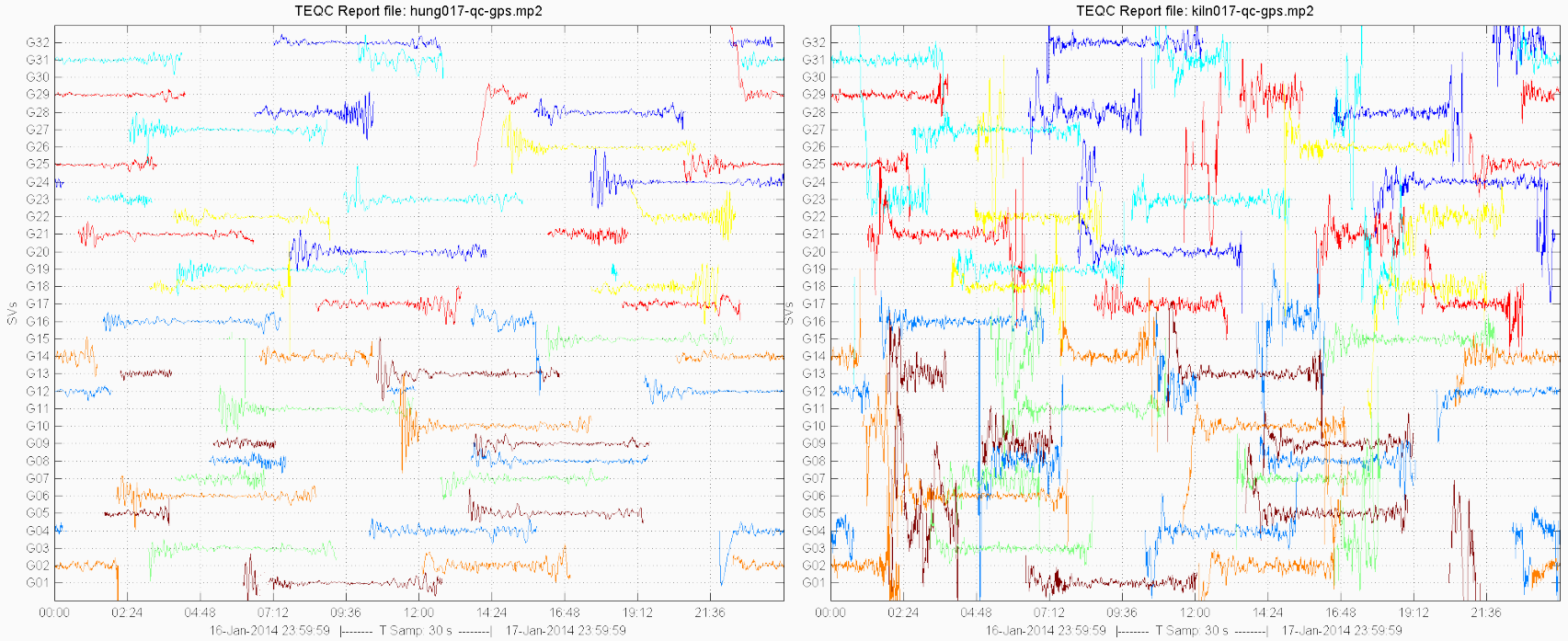
(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

Figure 10: *Comparison of TEQC MP2 outputs*



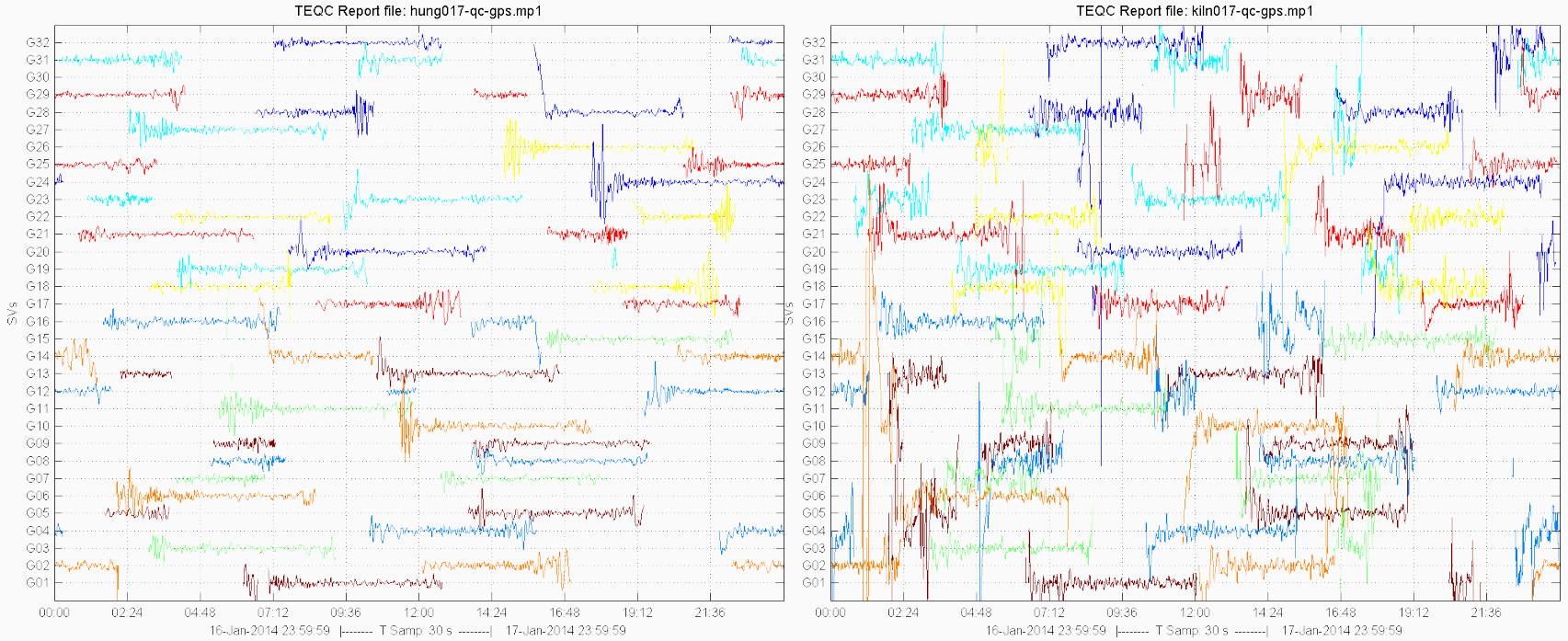
(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

Figure 11: *Comparison of TEQC MP1 outputs*



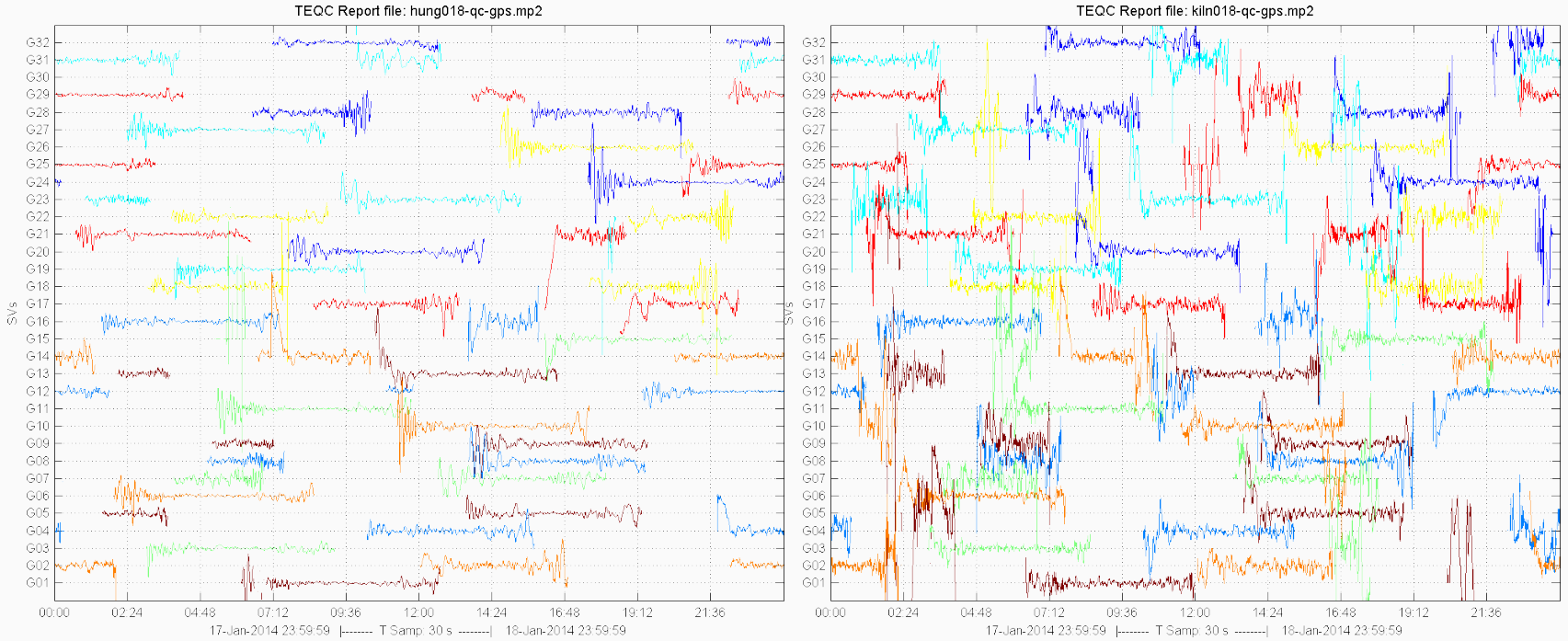
(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

Figure 12: *Comparison of TEQC MP2 outputs*



(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

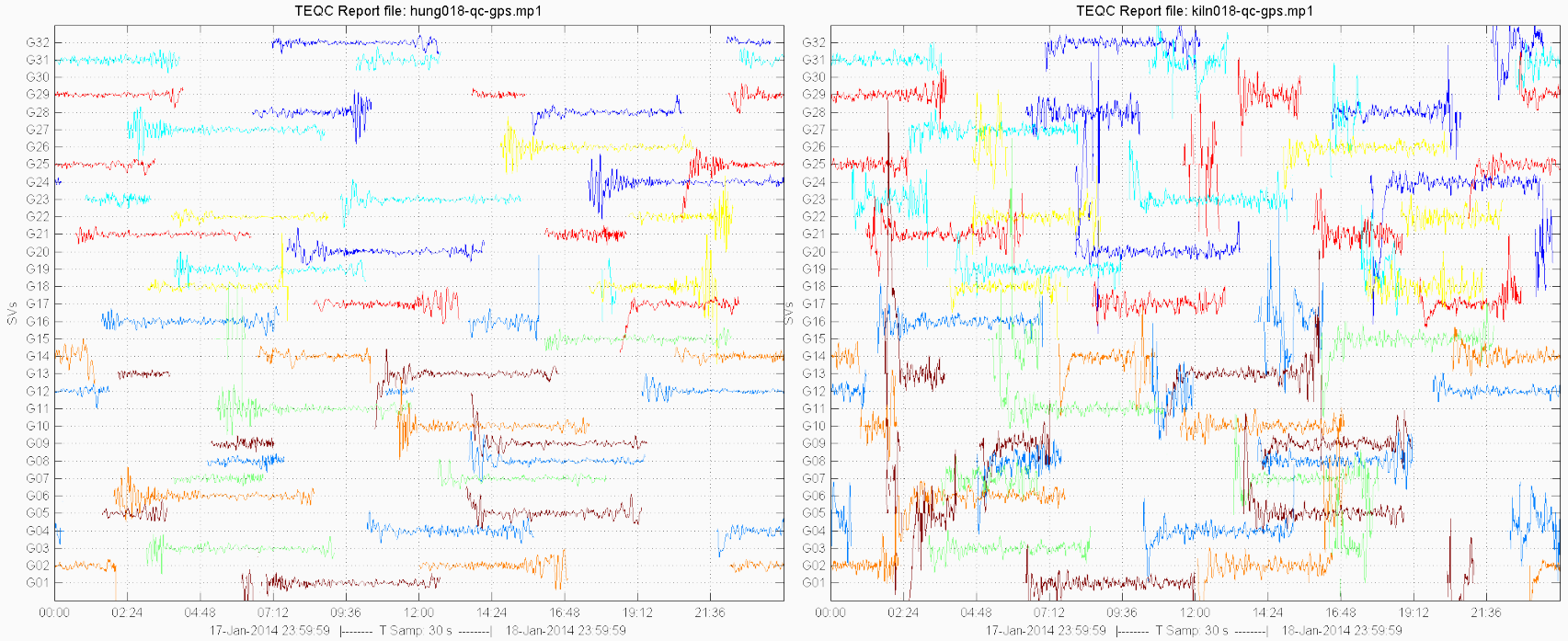
Figure 13: *Comparison of TEQC MP1 outputs*



(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

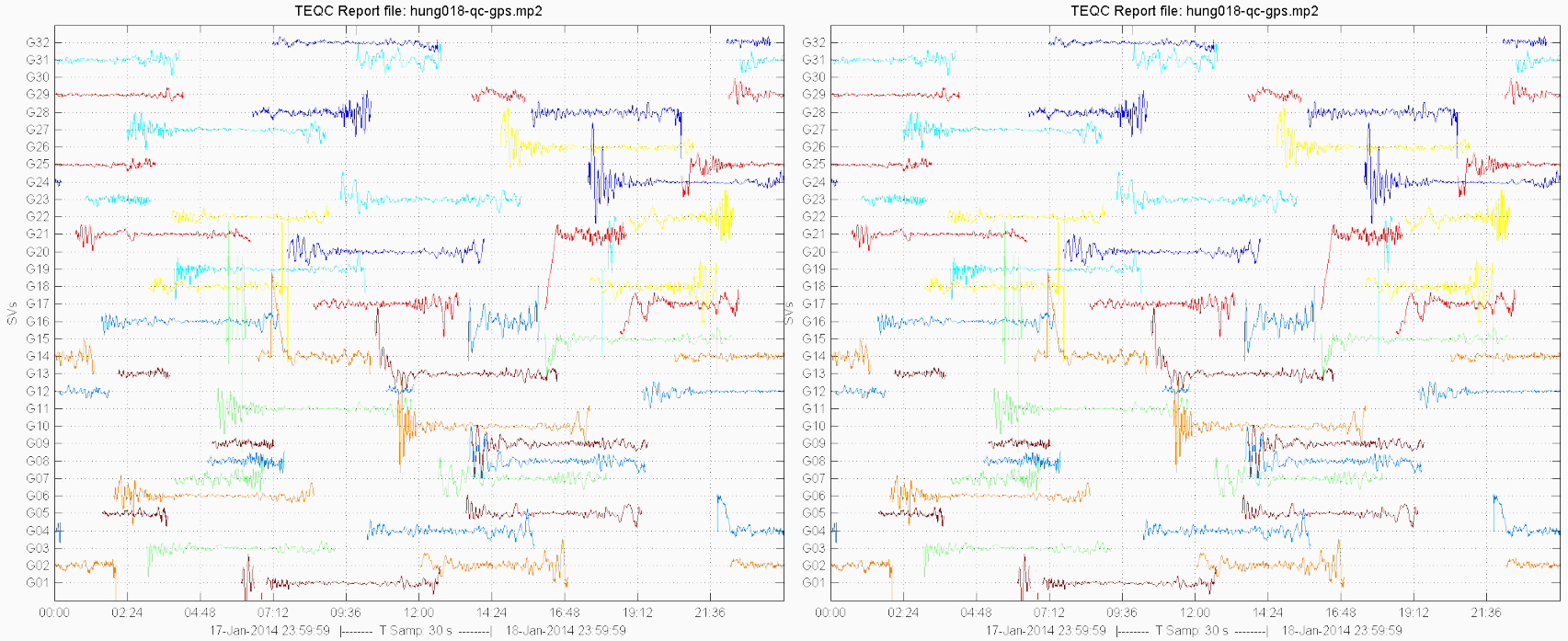
Figure 14: *Comparison of TEQC MP2 outputs*

Sunday 18/01/15, MP1



(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

Figure 15: *Comparison of TEQC MP1 outputs*



(a) *HUNG, no MP* **(b)** *KILN, suspected MP*

Figure 16: *Comparison of TEQC MP2 outputs*