

**WALLOPS ISLAND NATURAL RAIN
DATA ANALYSIS
by Ting-i Wang, ScTI**

ScTI has performed a detailed analysis of four (4) ORG-105 sensors tested by Wallops Island on 5/8/92. The four ORG's tested were S/N 2236, 2237, 2239, and 2241. Figure 1 shows a 30 minute time series of the individual ORG's, the ORG average, and the weighing gauge. The sensors tracked well with rainrates (RR) up to 45 mm/hr for the period. Figure 2 shows a plot of accumulated rainfall over the same period. It can be seen that even though the ORG's tracked well, some ORG's tended to read higher and some read lower during the event.

The individual ORG's were normalized to the ORG average and plotted again in Figure 3. The normalized coefficients are:

ORG S/N	Coefficient
2236	1.397
2237	1.108
2239	1.138
2241	0.997

Figure 4 shows the accumulated rainfall for the normalized ORG data. As can be seen by the very tight fit of the data, the application of a simple coefficient is sufficient to correct the data over the entire event with rainrates up to 45 mm/hr.

Figures 5 - 8 are graphs of the "percent difference" between each individual normalized sensor and the ORG average. The calculation of the percent difference was made as follows:

ORG average RR < 10 mm/hr

$$(\text{individual sensor RR} - \text{ORG average}) / 10$$

ORG average rainrate \geq 10 mm/hr

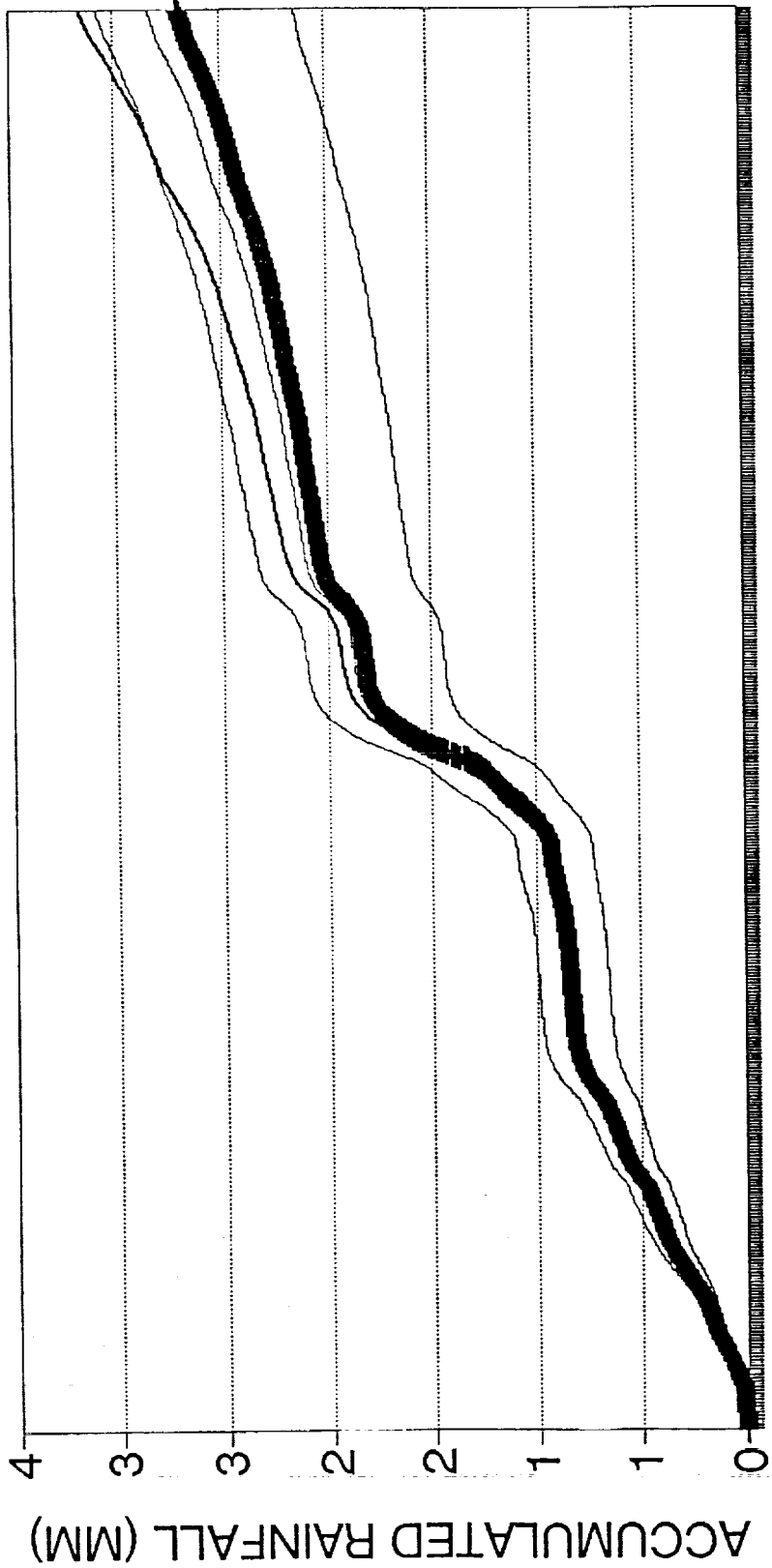
$$(\text{individual sensor RR} - \text{ORG average}) / \text{ORG average}$$

Most of the data is within +/- 10% with a standard deviation of less than 5%. Because of the ORG time resolution of 10 seconds, we believe that most of the fluctuations are caused by the fine space structure of the rain cell.

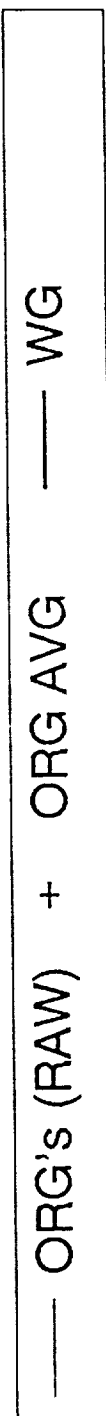
The final graph shown in Figure 9 is the percent difference of the weighing gauge to the ORG average. It shows more scatter than any of the ORG's. Unfortunately other meteorological data such as wind were not available for further studies.

WALLOPS ISLAND NATURAL RAIN

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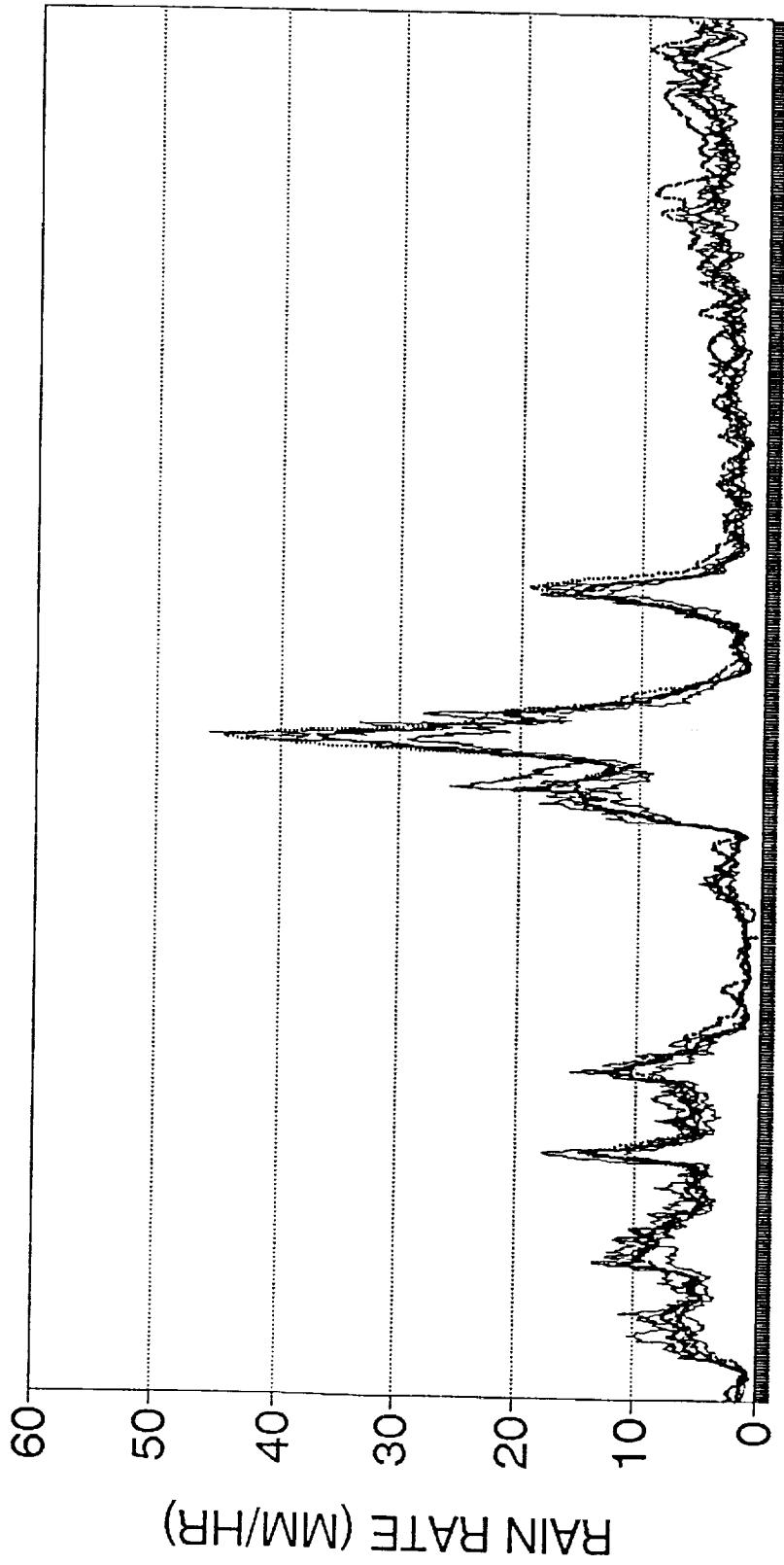


TIME



WALLOPS ISLAND NATURAL RAIN

A331-62(05/08/92 05:34:23)

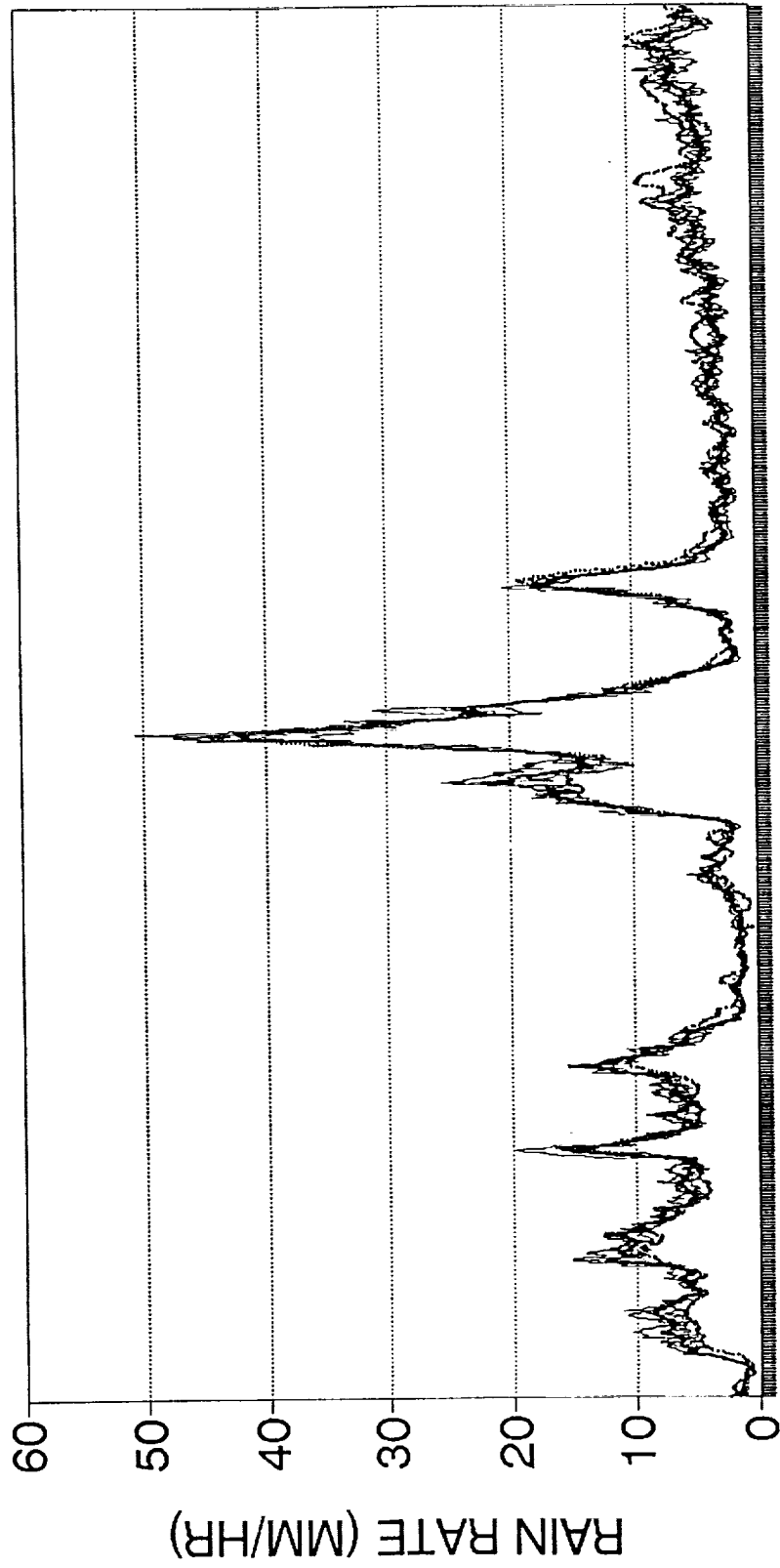


TIME



WALLOPS ISLAND NATURAL RAIN

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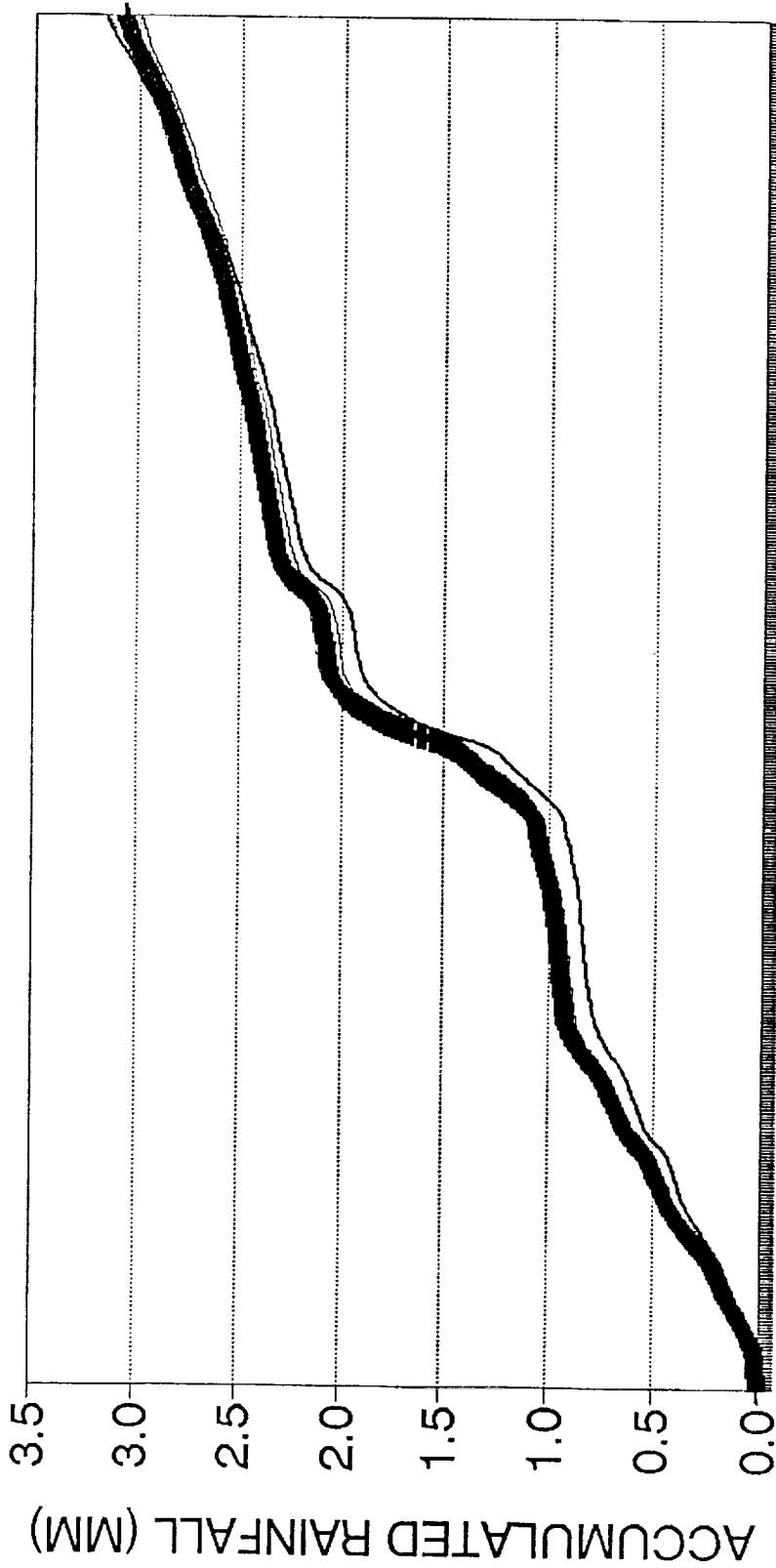


TIME

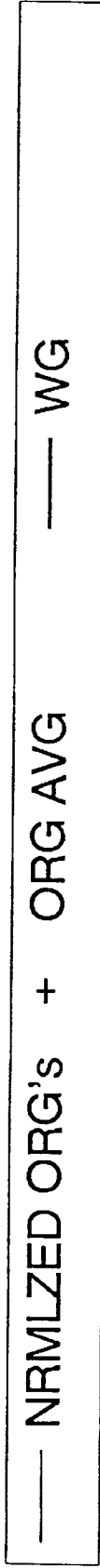
— NRMLZED ORG's — ORG AVG WG

WALLOPS ISLAND NATURAL RAIN

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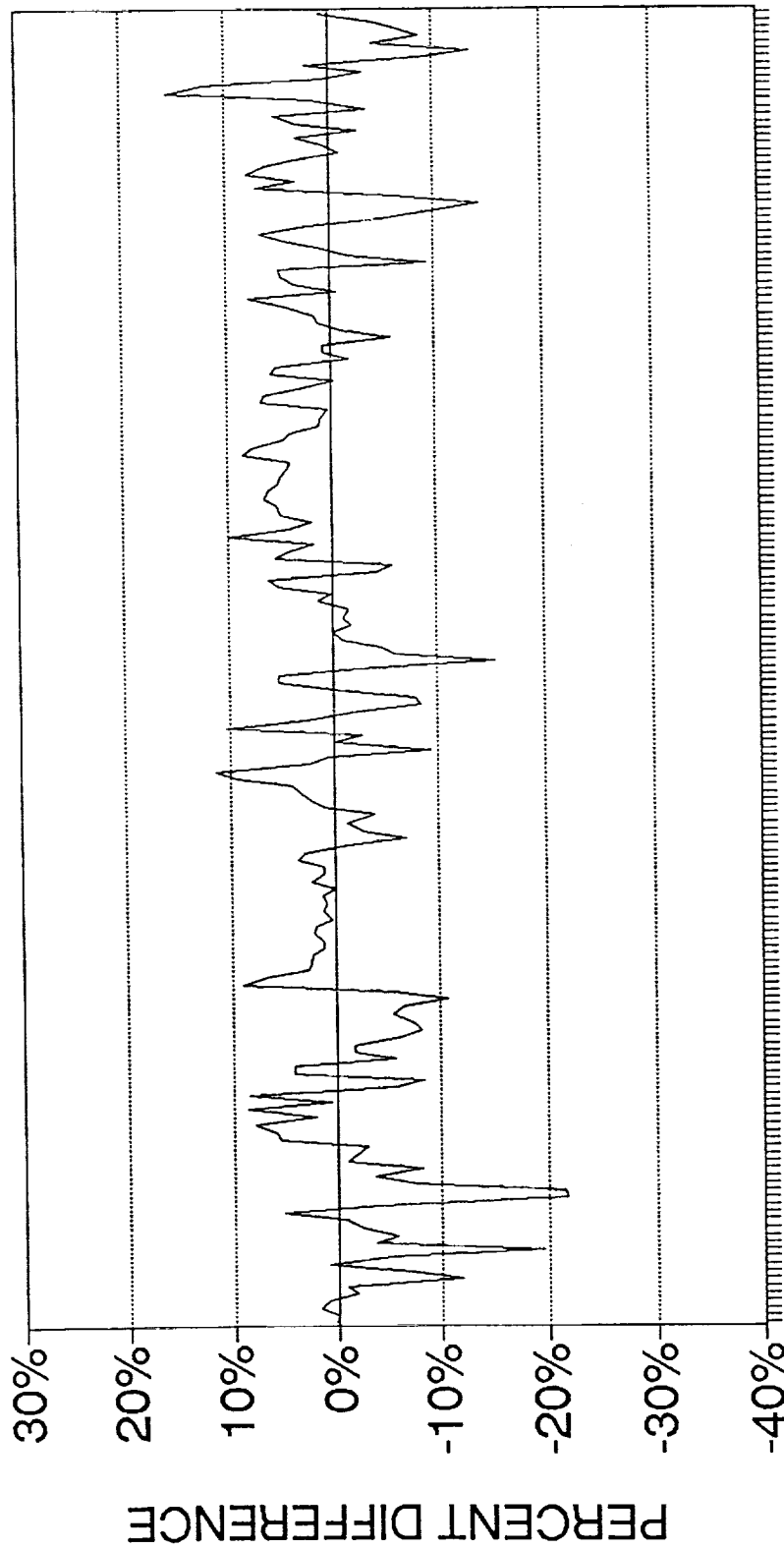


TIME



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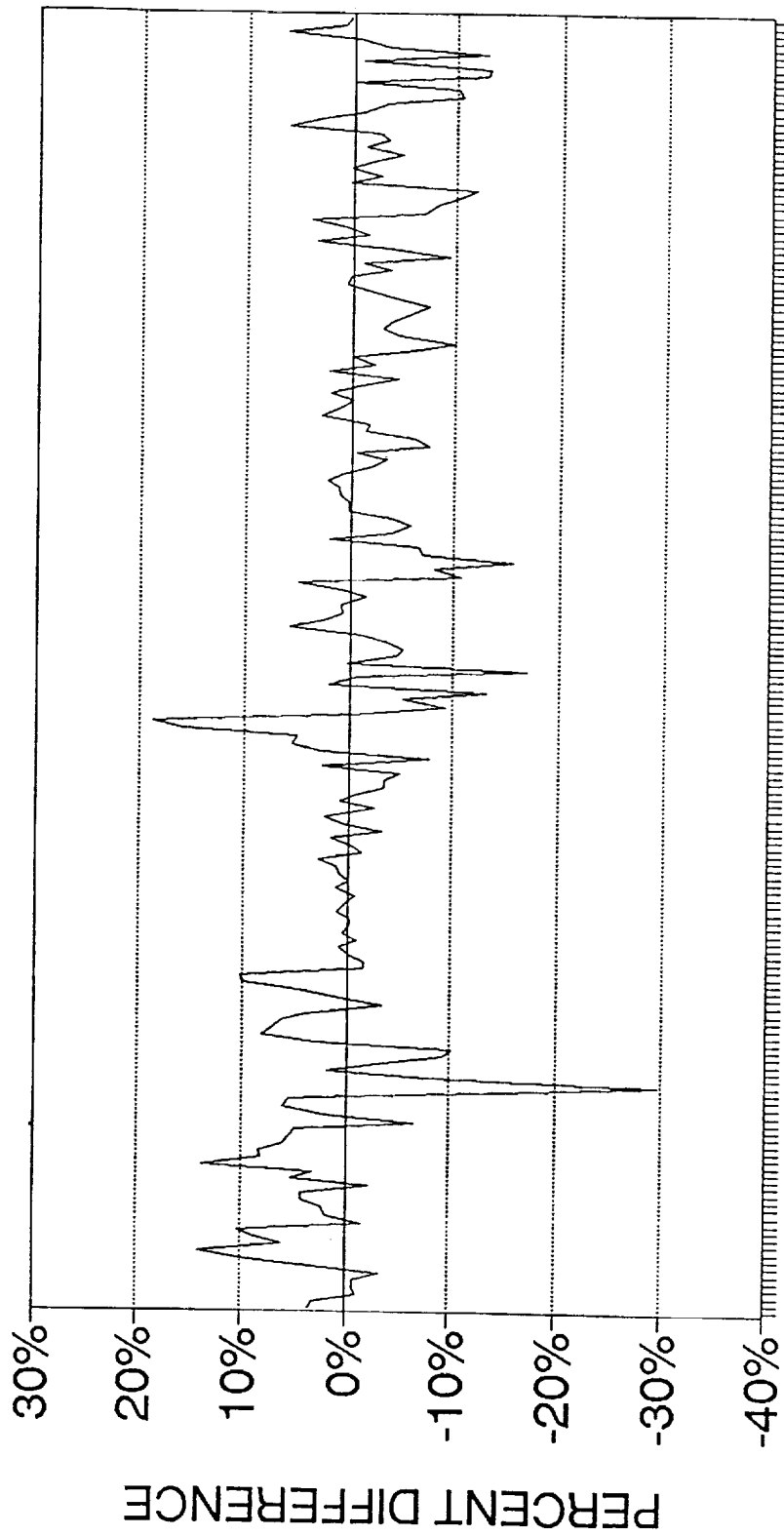


TIME (10 SECONDS)

— 2239(NORMALIZED)

WALLOPS ISLAND NATURAL RAIN

A331-62(05/08/92 05:34:23)

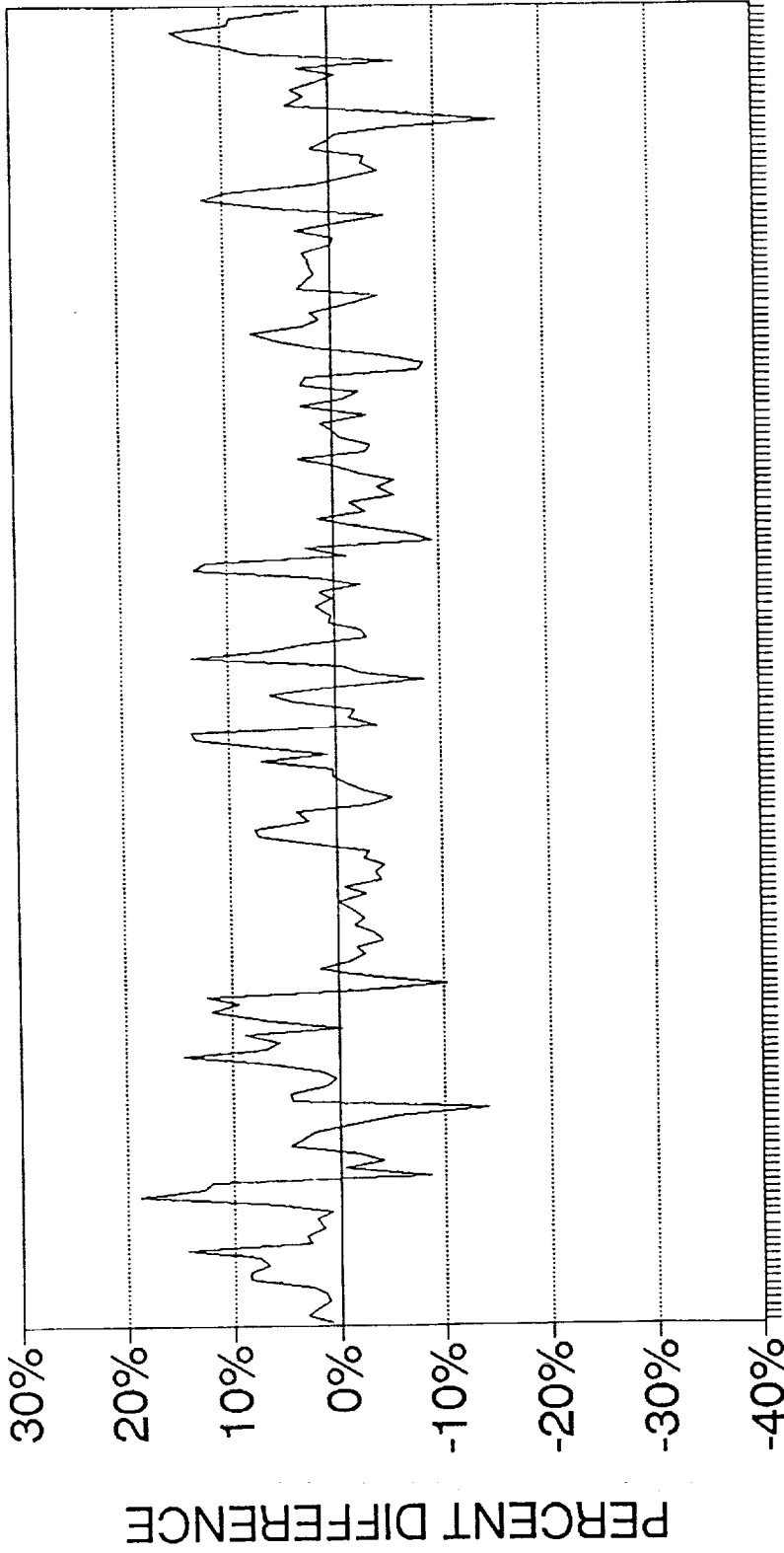


TIME (10 SECONDS)

— 2237(NORMALIZED)

WALLOPS ISLAND NATURAL RAIN

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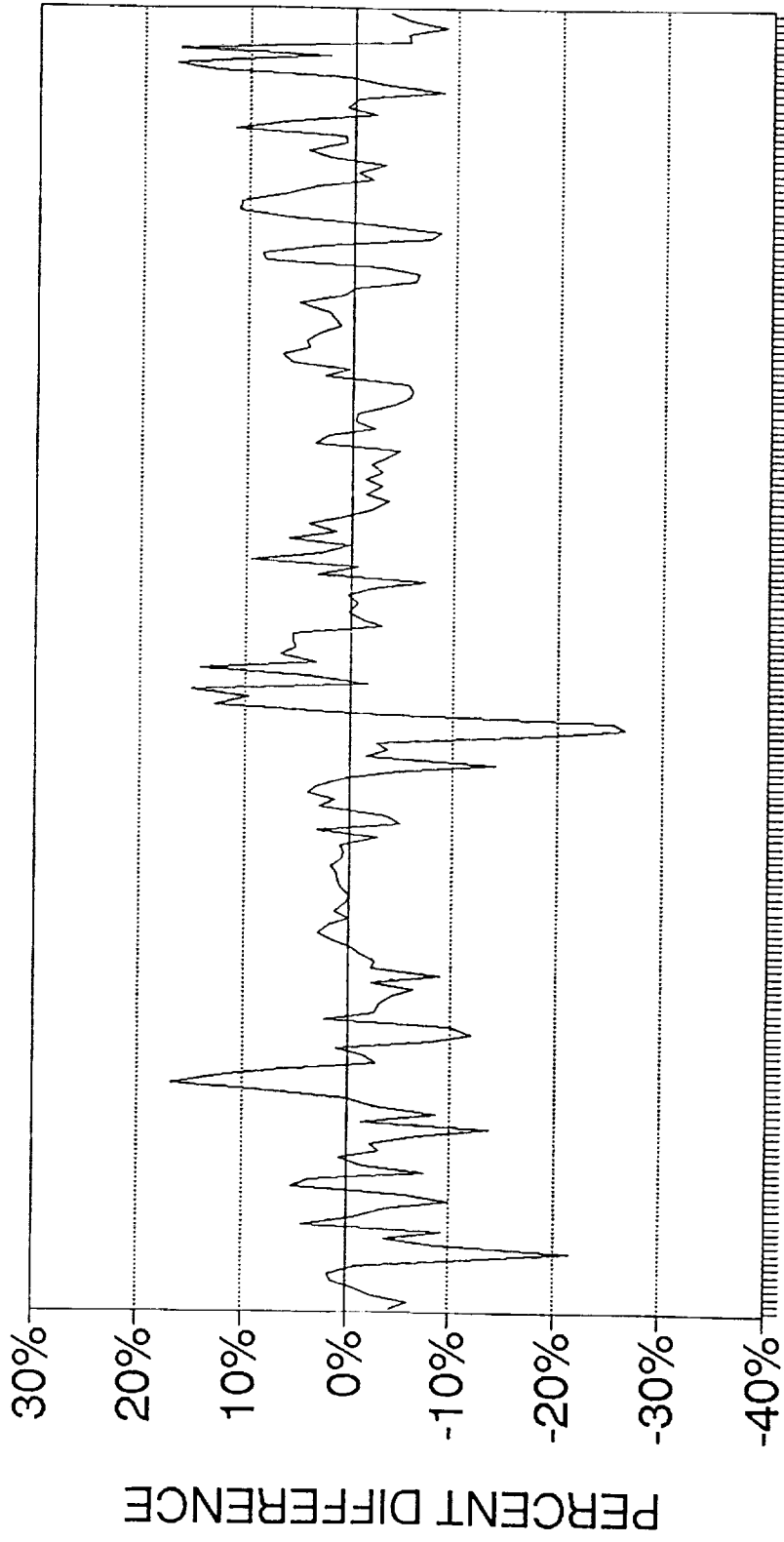


TIME (10 SECONDS)

— 2236(NORMALIZED)

WALLOPS ISLAND NATURAL RAIN

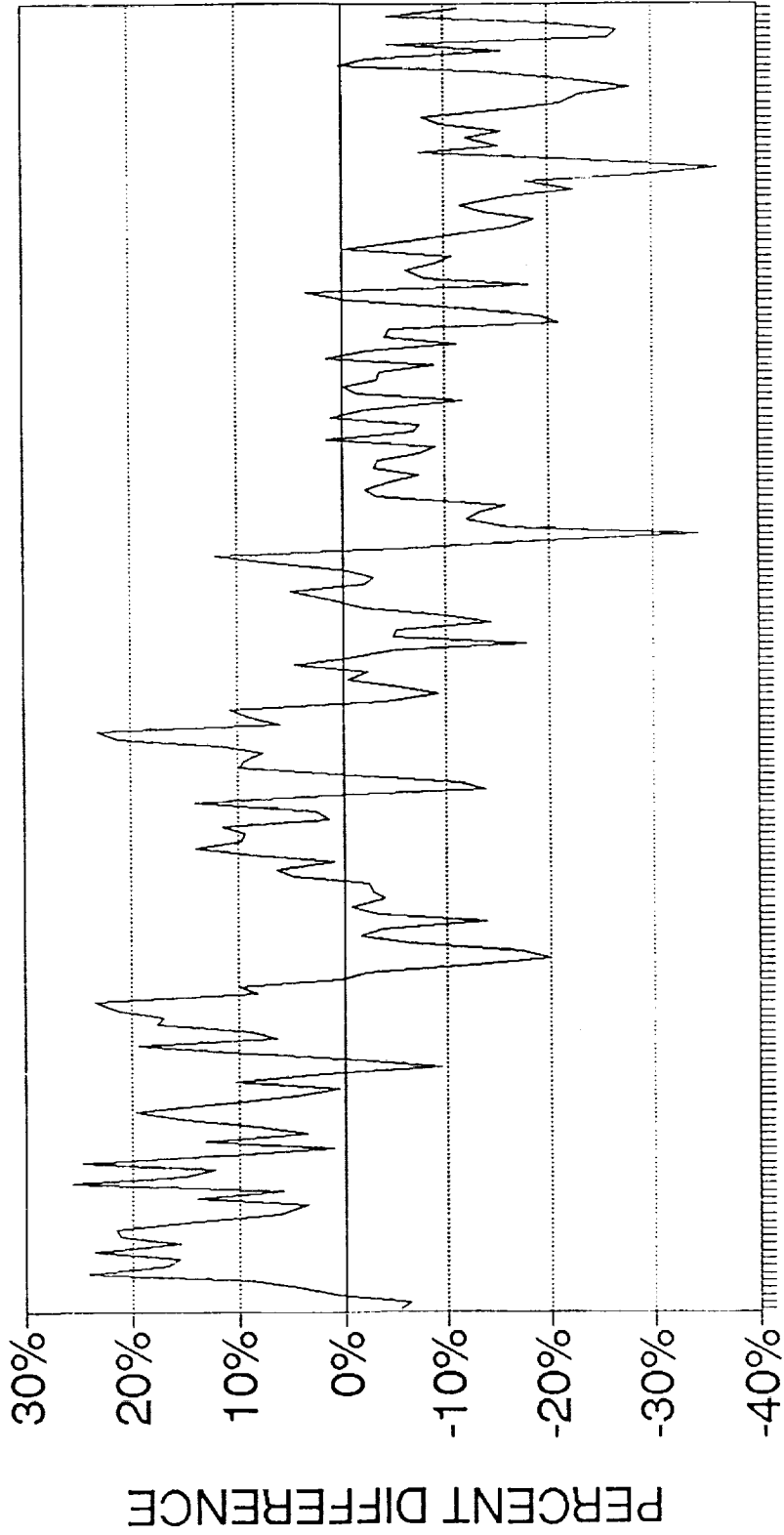
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— 2241(NORMALIZED)

WALLOPS ISLAND NATURAL RAIN

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TIME (10 SECONDS)

— WG