Data Article

Environmental data set for the design and analysis of the Photovoltaic system in the Jordan Valley

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ABSTRACT

Renewable energy penetration in the national electrical grid in Jordan has been rapidly increasing in the last few years, touching nearly 30%. Limited grid capacity has been a driver to slow down large-scale projects and has motivated increased attention towards off-grid photovoltaic (PV) systems. Planning properly-sized on-grid and off-grid systems requires accurate knowledge of the environmental and irradiance conditions at the installation site. As off-grid systems are equally of interest to non-critical types of loads, investments are directed towards agricultural applications like water pumping and desalination. To assess the potential of expanding the renewable energy penetration in agricultural areas in the Jordan valley and surrounding areas, this article presents annually measured environmental data including irradiance, temperature and wind speed, in addition to data related to soling on an existing off-grid PV system installed in the Jordan Valley. These data are used in the research article entitled “Performance Analysis of Off-grid PV systems in the Jordan Valley”, Al-Addous et al., 2017, and in the research article entitled “Modelling and Quantifying of Dust Accumulation Impact on PV Module Performance” Al-Addous et al., 2019. Data were collected and gathered using calibrated, high accuracy sensors installed at different parts of the installed plant.

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Specifications Table

| Subject                      | Renewable Energy and Sustainability |
|------------------------------|-------------------------------------|
| Specific subject area        | Renewable energy assessment, Photovoltaic system, On-grid system, Off-grid systems |
| Type of data                 | Tables and Graphs                   |
| How data were acquired       | Actual Measurements and Data acquisition. IV tracer: SOLMETRIC PVA-1000 S. Weather station: Reinhardt MWS 10. |
| Data format                  | Raw and analysed                    |
| Parameters for data collection | Data collected based on continuous measurements of different environmental variables at the site of installation to understand. |
| Description of data collection | Specialized sensors were installed at the site in Jordan Valley to collect continuous measurements of environmental data. Data was automatically recorded every 10 min for the period 2017 to 2018. Some records are missing and has been removed with no major or minor effect on data sets. |
| Data source location         | Country: Hashemite Kingdom of Jordan, Jordan valley, 390 m below sea level. |
| Data accessibility           | Uploaded with the article.          |
| Related research article     | [1] M. Al-Addous, Z. Dalala, C. B. Class, F. Alawneh, and H. Al-Taani. "Performance analysis of off-grid PV systems in the Jordan Valley." Renewable Energy, vol. 113, pp. 930–941, 2017/12/01/ 2017. |

Value of the Data

- The data provided is required to understand the potential of the off-grid and on-grid PV power systems in the Jordan Valley and surrounding areas.
- The data set is important for modelling engineers and for PV system's sizing and design engineers. Where environmental data and soiling behaviour in the region could affect the projected power production potential of installed PV systems.
- The data presented offer unique coupling of different environmental variables at the same location, which enables researchers to examine correlation with different generation, and sizing variables.
- The data set offers unique examination of different PV module's technology and assesses their comparative performance under identical environmental conditions.

1. Data description

The data provided in this paper is used for the development and analysis of an off-grid PV system in Jordan Valley. The datasets presented were collected from different monitoring and measurement sensors installed at different sections of the off-grid plant installed at the site in Jordan Valley. It includes environmental data that are closely needed for proper system's sizing and design. Temperature, wind speed, irradiance, panel back temperature, and soiling data are described. The datasets are provided with this article in the form of tables and figures, which are described in Table 1.

The performance of PV systems highly relies on the environmental conditions [2–4], were sizable deteriorations on the generation capacity can be observed due to high temperatures rise and dust accumulations [5,6].

The temperature data were collected in the Jordan Valley using a sampling rate of six samples/hour. The datasets are supplied in separate Excel files. The boxplot of monthly temperature data during a time period of 2017–2018 is shown in Fig. 1. The measurements show that the Jordan Valley has high temperatures during the months of May to October with medians above
Fig. 1. Boxplot of Temperature data over the period 2017–2018 (a) 2017 and (b) 2018.
Table 1
Description of items and datasets provided with article.

| Item | Title | Description of content |
|------|-------|-------------------------|
| 1.   | Fig. 1 | Statistical Plots for Temperature values of 2017–2018 |
| 2.   | Fig. 2 | Statistical Plots for Wind speed values of 2017–2018 |
| 3.   | Fig. 3 | Statistical Plots for Irradiance values of 2017–2018 |
| 4.   | Table 2 | Summary of weather data |
| 5.   | Fig. 4 | Effect of PV module soiling on incident global irradiance. |
| 6.   | Fig. 5 | Effect of PV module soiling on output IV characteristics |
| 7.   | Table 3 | Technical Specifications for PV Modules under Test |
| 8.   | Table 4 | SLI Measurements for 130 Wp PV Module during Test Period: 27/07–07/11/2017 |
| 9.   | Table 5 | SLI Measurements for 310 Wp PV Module during Test Period: 22/05–07/11/2017 |
| 10.  | Table 6 | SLI Measurements for 80 Wp PV Module during Test Period: 02/09–31/10/2018 |
| 11.  | Fig. 6 | Schematic Diagram of and hardware photo of the PV Modules testing setup |

Table 2
Summary of weather data.

| Solar irradiance | Weather Station |
|------------------|-----------------|
|                  | Average ambient temp. °C | Minimum ambient temp. °C | Average wind speed m/min | Minimum wind speed m/min | Maximum wind speed m/min |
| 0–100            | 24.02            | 6.03              | 47.08               | 0.35                       | 0.00                       | 35.58                       |
| 100–200          | 29.27            | 8.38              | 48.98               | 0.57                       | 0.00                       | 23.92                       |
| 200–300          | 30.98            | 11.74             | 51.00               | 0.75                       | 0.00                       | 28.39                       |
| 300–400          | 32.71            | 12.38             | 52.21               | 0.63                       | 0.00                       | 29.27                       |
| 400–500          | 33.86            | 13.13             | 53.72               | 0.70                       | 0.00                       | 30.86                       |
| 500–600          | 34.64            | 14.04             | 53.16               | 0.71                       | 0.00                       | 26.31                       |
| 600–700          | 36.65            | 14.30             | 53.57               | 0.69                       | 0.00                       | 28.11                       |
| 700–800          | 40.10            | 16.31             | 53.13               | 0.44                       | 0.00                       | 24.52                       |
| 800–900          | 41.57            | 16.75             | 53.31               | 0.57                       | 0.00                       | 23.92                       |
| 900–1000         | 40.13            | 18.36             | 51.16               | 0.82                       | 0.00                       | 20.04                       |
| 1000–1100        | 36.29            | 29.03             | 42.78               | 1.57                       | 0.00                       | 24.52                       |
| 1100–1200        | 33.71            | 30.85             | 39.79               | 1.59                       | 0.00                       | 17.82                       |

25°C. The lowest recorded temperature is very close to 0°C and the highest recorded is slightly above 50°C.

Fig. 2 shows the boxplot of radiation data over the years 2017–2018. The highest radiation month is June with median of 100 W/m² and peak close to 1230 W/m². The lowest average radiation was recorded in the month of December. The Median radiation in December is almost 0 W/m² with peak radiation close to 440 W/m².

The wind resource in the Jordan valley assessed by measuring the instantaneous wind speed. The instantaneous wind speed in the boxplot, as shown in Fig. 3, changes between 0 and 17 m/s. The third quantile of the instantaneous wind speed is close to 5 m/s, which means that 75% of the recorded wind speeds are equal to or lower than the speed of 5 m/s.

Table 2 shows the average wind speed and average temperature for different ranges of solar radiation. The average temperature ranges from around 25°C for 1 – 100 W/m² irradiance level to around 35°C for 1100 – 1200 W/m² irradiance level.

Soiling Loss Index (SLI) is defined as the loss incurred due to the lower irradiance levels reaching the cells inside the PV modules. Soiling loss is used to characterise the losses incurred by dust deposition on the surfaces of PV modules. The simulated data in Fig. 4 explains the effect of soiling on the effective irradiance level reaching the PV cells inside the module, and Fig. 5 shows the mechanism under which the SLI is calculated. A clean reference PV module is used to project the ideal irradiance levels reaching the cells inside the PV module, and counterpart measurements are taken for the soiled PV module where by then, the SLI is found and described.
Fig. 2. Boxplot of Radiation data over the period 2017–2018 (a) 2017 and (b) 2018.
Fig. 3. Boxplot of instantaneous wind speed data over the period 2017–2018 (a) 2017 and (b) 2018.
as explained by Eq. (1) below [2]:

\[
SLI = \frac{G_{\text{eff, Dirty}} - G_{\text{eff, Clean}}}{G_{\text{eff, Clean}}} \times 100\%
\]  

(1)

Where \( G_{\text{eff, Dirty}} \) is the effective incident irradiance level in \( W/m^2 \) on the dirty surface while \( G_{\text{eff, Clean}} \) is for the clean or reference one. The effective irradiance information is described by Eq. (2) below [7]:

\[
G_{\text{eff}} = \frac{I_{sc}}{I_{sc0}} \times G_o \times \frac{1}{[1 + \alpha (T - T_o)]}
\]  

(2)

where:
- \( I_{sc} \): measured short-circuit current of the PV module
- \( I_{sc0} \): short-circuit current of the PV module at STC
- \( T \): measured backside temperature of the PV module
- \( T_o \): backside temperature of PV module at STC, \( T_o = 25^\circ C \)
Fig. 6. Schematic Diagram of and hardware photo of the PV Modules testing setup [2].
Table 3
Technical Specifications for PV Modules under Test [2].

| PV Module Rating | 130 Wp | 310 Wp | 80 Wp |
|------------------|--------|--------|-------|
| Manufacturer     | Centrosolar, Germany | Suntech, China | Calyxo, Germany |
| Model, No.       | SM520S | STP310-24/Vem | CX3pro 80/2 |
| Cell Technology  | Wafer-based poly-Si 2BB | Wafer-based poly-Si 3BB | Glass Thin-film |
| Cell Dimensions  | 156 × 156 mm | 156 × 156 mm | narrow strip |
| Number of Cells  | 36 | 72 | not mentioned in datasheet |
| Module Front Glass | Tempered glass | 4 mm Tempered glass | 3.2 mm glass |
| Module Back Sheet | Blue Tedlar | White Tedlar | 3.2 mm glass |
| module frame     | aluminium | aluminium | Frameless |
| Module Dimensions | 1500 × 680 × 40 mm | 1956 × 992 × 40 mm | 1200 × 600 × 214 mm |
| Module Weight    | 12.1 kg | 25.8 kg | 12 kg |
| Max. Efficiency @ STC | 12.70% | 16% | 8.30% |
| Open Circuit Voltage @ STC | 21.9 V | 44.9 V | 56.7 V |
| Short Circuit Current @ STC | 8.20 A | 8.96 A | 2.17 A |
| Max. Power Voltage @ STC | 17.4 V | 44.9 V | 43.5 V |
| Max. Power Current @ STC | 7.5 A | 8.5 A | 1.87 A |
| Nominal Power Tolerance | +/− 5% (+/−6.5 W) | 0/+ 5 W | +10% / −5% (+8/−4 W) |
| Current Temp. Coefficient | +0.028% / °C | −0.067% / °C | +0.02% / °C |
| Voltage Temp. Coefficient | −0.36% / °C | −0.33% / °C | −0.24% / °C |
| Power Temp. Coefficient | −0.45% / °C | −0.41% / °C | −0.25% / °C |

$G_o$: Incident global solar irradiance on the surface of PV module at STC, $G_o = 1000 \text{ W/m}^2$.

α: Temperature coefficient of short-circuit current (%/°C)

Soiling data were collected for three different PV modules with different power ratings and at different time slots. Data are supplied in a separate Excel file as well. The PV modules under testing are listed in Table 3. Table 4 shows the SLI measurements on the test module rated 130 Wp for the period from July, 27th to November, 7th of 2017. Two cleaning instances are imposed on the test setup on the dates 30/07/2017 and 11/10/2017. Same procedure is repeated for the PV module rated at 310 Wp, as depicted in Table 5 for the time period from May, 22nd to November, 7th of 2017. The module was cleaned on August, 21st and on November, 10th, 2017. Table 6 shows the measurements for the PV module rated at 80 Wp, for the time extending from September, 9th to October, 31st of 2018. Two cleanings were carried out on September, 2nd and another one on October, 24th of 2018.

2. Experimental design, materials, and methods

The testing setup was designed and installed at the Jordan Valley with coordinates of 31° 54’38.78”N and 35° 34’040.63”E. Schematic diagram of the installed setup is shown in Fig. 10. The figure shows the details of the test setup. In the left hand side, it shows the schematic of the measurements setup, where continuous measurements are acquired by the high precision IV curve characterizer. The signals include the voltage, current and temperature. A separate Pyranometer is installed at the same elevation as the PV module to acquire irradiance information. Communication bus is established to store the data in the computer workspace. A separate weather station was installed also to collect the data for the ambient temperature, wind speed, and solar irradiance. In the right hand side, a photo of the actual setup is shown where three different test PV module types are shown.

Three PV modules as shown in the figure were installed and natural dust accumulation was allowed during the testing period with occasional cleaning to reset the power production for each module. The IV-curve measurements were acquired around the noontime where irradiance is maximum and above 800 W/m² according to the IEC 60,904. This avoids any differences in soiling loss due to zenith angle of sun, module current dependence on irradiance level or spec-
Table 4
SLI Measurements for 130 Wp PV Module during Test Period: 27/07 - 07/11/2017 (16 weeks).

| Date & Time               | Vmpp (V) | Impp (A) | Voc (V) | Isc (A) | G (W/m²) | Panel back Temp. (°C) |
|---------------------------|----------|----------|---------|---------|----------|-----------------------|
| 8/28/2018, 12:48:50 PM    | 35.5     | 1.8      | 48.1    | 2.1     | 952.2    | 69.5                  |
| 9/2/2018, 12:38:39 PM     | 35.3     | 1.7      | 47.5    | 2.0     | 930.2    | 70.6                  |
| 9/4/2018, 1:09:42 PM      | 34.9     | 1.7      | 47.3    | 2.0     | 965.2    | 68.3                  |
| 9/5/2018, 12:43:15 PM     | 35.2     | 1.7      | 47.5    | 2.0     | 935.4    | 70.1                  |
| 9/9/2018, 12:44:18 PM     | 36.2     | 1.7      | 48.8    | 2.0     | 944.7    | 64.7                  |
| 9/10/2018, 12:49:55 PM    | 35.9     | 1.7      | 48.4    | 2.0     | 948.7    | 66.7                  |
| 9/12/2018, 12:29:13 PM    | 35.5     | 1.7      | 48.0    | 1.9     | 947.3    | 67.8                  |
| 9/16/2018, 12:55:09 PM    | 35.7     | 1.7      | 48.2    | 2.0     | 973.7    | 64.9                  |
| 9/17/2018, 12:43:25 PM    | 35.6     | 1.7      | 48.1    | 2.0     | 959.5    | 65.7                  |
| 9/18/2018, 12:29:18 PM    | 35.7     | 1.7      | 48.1    | 1.9     | 930.0    | 65.3                  |
| 9/19/2018, 12:32:02 PM    | 36.3     | 1.7      | 48.9    | 2.0     | 955.8    | 62.0                  |
| 9/23/2018, 12:36:30 PM    | 35.8     | 1.6      | 48.3    | 1.9     | 962.8    | 64.8                  |
| 9/24/2018, 12:43:19 PM    | 35.7     | 1.6      | 48.2    | 1.9     | 961.3    | 63.8                  |
| 9/25/2018, 12:47:03 PM    | 35.6     | 1.6      | 48.1    | 1.8     | 878.4    | 63.7                  |
| 9/26/2018, 1:03:15 PM     | 35.9     | 1.5      | 48.3    | 1.8     | 927.6    | 61.1                  |
| 9/29/2018, 12:34:18 PM    | 35.7     | 1.0      | 47.5    | 1.2     | 643.4    | 60.3                  |
| 10/1/2018, 12:43:27 PM    | 36.1     | 0.8      | 47.5    | 0.9     | 501.4    | 54.8                  |
| 10/2/2018, 12:31:00 PM    | 35.9     | 1.4      | 48.2    | 1.7     | 905.6    | 60.1                  |
| 10/3/2018, 12:59:18 PM    | 35.7     | 1.4      | 47.8    | 1.6     | 887.2    | 61.4                  |
| 10/7/2018, 12:35:06 PM    | 36.2     | 1.5      | 48.5    | 1.7     | 938.4    | 61.7                  |
| 10/8/2018, 12:55:44 PM    | 36.0     | 1.4      | 48.2    | 1.6     | 894.0    | 59.3                  |
| 10/9/2018, 12:36:00 PM    | 36.3     | 1.3      | 48.5    | 1.5     | 841.5    | 58.5                  |
| 10/10/2018, 12:06:13 PM   | 36.2     | 1.4      | 48.5    | 1.7     | 913.4    | 59.7                  |
| 10/14/2018, 12:44:44 PM   | 33.4     | 1.4      | 48.1    | 1.6     | 885.6    | 60.5                  |
| 10/21/2018, 12:31:43 PM   | 36.3     | 1.2      | 48.3    | 1.4     | 853.2    | 57.4                  |
| 10/23/2018, 12:38:09 PM   | 36.3     | 1.3      | 48.4    | 1.6     | 949.4    | 57.0                  |
| 10/28/2018, 1:13:55 PM    | 37.8     | 1.5      | 50.5    | 1.8     | 828.6    | 50.7                  |
| 10/28/2018, 12:47:47 PM   | 37.7     | 1.6      | 50.5    | 1.9     | 888.4    | 51.8                  |
| 10/29/2018, 12:17:53 PM   | 36.6     | 1.6      | 49.2    | 1.9     | 899.0    | 59.2                  |
| 10/30/2018, 11:59:58 AM   | 36.7     | 1.7      | 49.4    | 2.0     | 917.5    | 56.8                  |
| 10/31/2018, 12:33:05 PM   | 36.4     | 1.6      | 48.9    | 1.8     | 855.6    | 58.3                  |

Utility differences. Any unstable data that might have been resulted due to clouds or partial shading are filtered out to generate stable and uniform data.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships, which have, or could be perceived to have, influenced the work reported in this article.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.dib.2020.105794.
Table 5
SLI Measurements for 310 Wp PV Module during Test Period: 22/05 - 07/11/2017 (25 weeks).

| Date & Time       | Vmpp (V) | Impp (A) | Voc (V) | Isc (A) | G (W/m²) | Panel back Temp. (°C) |
|-------------------|----------|----------|---------|---------|----------|-----------------------|
| 5/21/2017 13:10   | 31.5     | 7.2      | 40.3    | 7.8     | 874.5    | 52.5                  |
| 5/22/2017 13:11   | 31.3     | 7.1      | 40.1    | 7.6     | 862.6    | 54.7                  |
| 5/23/2017 12:36   | 31.3     | 7.8      | 40.1    | 8.5     | 960.9    | 55.1                  |
| 5/24/2017 12:48   | 31.6     | 7.2      | 40.5    | 7.8     | 881.5    | 52.0                  |
| 5/28/2017 12:39   | 30.1     | 7.2      | 38.9    | 7.8     | 880.5    | 61.8                  |
| 5/29/2017 12:29   | 30.5     | 7.2      | 39.3    | 7.8     | 882.7    | 59.6                  |
| 6/4/2017 12:32    | 29.8     | 7.0      | 38.7    | 7.7     | 874.0    | 64.6                  |
| 6/6/2017 12:30    | 30.4     | 7.2      | 39.3    | 7.8     | 897.4    | 59.2                  |
| 6/7/2017 12:32    | 29.9     | 7.2      | 38.8    | 7.8     | 894.0    | 64.4                  |
| 6/12/2017 12:38   | 30.3     | 6.9      | 39.2    | 7.5     | 861.1    | 60.3                  |
| 6/15/2017 12:30   | 30.6     | 6.8      | 39.5    | 7.3     | 852.6    | 55.7                  |
| 6/18/2017 12:24   | 30.3     | 6.8      | 39.1    | 7.4     | 856.7    | 62.8                  |
| 6/22/2017 12:30   | 31.1     | 6.8      | 39.8    | 7.4     | 860.8    | 56.7                  |
| 6/29/2017 12:33   | 29.8     | 6.8      | 38.7    | 7.5     | 877.5    | 64.1                  |
| 7/5/2017 12:32    | 30.1     | 6.3      | 38.5    | 6.9     | 826.5    | 64.5                  |
| 7/11/2017 12:28   | 30.1     | 6.2      | 38.5    | 7.0     | 841.6    | 64.6                  |
| 7/17/2017 12:27   | 30.2     | 6.2      | 38.1    | 7.1     | 868.2    | 66.7                  |
| 7/25/2017 12:42   | 31.0     | 5.9      | 38.5    | 7.0     | 855.7    | 63.2                  |
| 8/6/2017 12:31    | 31.9     | 5.7      | 38.7    | 7.2     | 899.9    | 64.3                  |
| 8/16/2017 12:47   | 32.2     | 5.4      | 38.5    | 7.1     | 888.8    | 64.1                  |
| 8/20/2017 12:31   | 33.1     | 5.4      | 39.6    | 7.0     | 887.4    | 55.0                  |
| 8/21/2017 12:15   | 29.5     | 7.5      | 38.7    | 8.1     | 883.3    | 66.7                  |
| 8/22/2017 12:39   | 30.3     | 7.7      | 39.4    | 8.3     | 908.2    | 61.2                  |
| 8/27/2017 12:33   | 30.1     | 7.7      | 39.4    | 8.3     | 933.5    | 61.1                  |
| 8/29/2017 10:50   | 30.1     | 7.5      | 39.3    | 8.2     | 927.9    | 61.9                  |
| 9/18/2017 12:33   | 29.8     | 7.6      | 39.0    | 8.3     | 970.1    | 64.3                  |
| 9/24/2017 12:31   | 30.2     | 7.1      | 39.3    | 7.9     | 934.3    | 60.0                  |
| 9/28/2017 12:34   | 30.3     | 7.4      | 39.2    | 8.2     | 978.7    | 62.0                  |
| 10/4/2017 12:32   | 30.4     | 7.3      | 39.2    | 8.2     | 983.9    | 61.1                  |
| 10/8/2017 12:27   | 31.9     | 6.9      | 40.3    | 7.9     | 953.1    | 54.2                  |
| 10/11/2017 12:24  | 29.9     | 8.4      | 39.3    | 9.1     | 1000.5   | 62.4                  |
| 10/17/2017 12:48  | 29.9     | 7.4      | 39.4    | 8.0     | 908.0    | 61.2                  |
| 10/22/2017 12:39  | 30.2     | 7.8      | 39.5    | 8.4     | 960.4    | 60.7                  |
| 10/29/2017 12:29  | 32.0     | 6.6      | 40.6    | 7.1     | 840.7    | 51.0                  |
| 11/6/2017 12:38   | 31.3     | 6.4      | 39.9    | 7.0     | 827.1    | 54.9                  |
| 11/7/2017 12:13   | 32.9     | 4.8      | 40.5    | 5.2     | 623.4    | 43.9                  |
Table 6
SLI Measurements for 80 Wp PV Module during Test Period: 02/09 - 31/10/2018 (9 weeks).

| Date & Time    | Vmp (V) | Imp (A) | Voc (V) | Isc (A) | G (W/m²) | Panel back Temp. (°C) |
|----------------|---------|---------|---------|---------|----------|-----------------------|
| 7/25/2017 13:44 | 12.9    | 4.7     | 17.8    | 5.1     | 751.8    | 69.5                  |
| 7/27/2017 12:03 | 12.9    | 4.9     | 18.0    | 5.4     | 805.0    | 66.6                  |
| 7/30/2017 12:39 | 12.6    | 6.3     | 18.3    | 7.2     | 869.0    | 67.2                  |
| 8/6/2017 12:33  | 12.7    | 6.2     | 18.2    | 7.0     | 853.2    | 67.6                  |
| 8/16/2017 12:19 | 12.5    | 6.0     | 18.2    | 6.8     | 866.1    | 68.5                  |
| 8/24/2017 11:10 | 12.8    | 5.9     | 18.2    | 6.7     | 867.3    | 68.7                  |
| 8/29/2017 11:22 | 12.5    | 6.2     | 18.3    | 7.2     | 929.9    | 67.9                  |
| 9/5/2017 12:13  | 12.4    | 6.2     | 18.0    | 7.0     | 929.0    | 70.1                  |
| 9/17/2017 11:11 | 12.7    | 6.4     | 18.4    | 7.1     | 946.5    | 67.3                  |
| 9/18/2017 11:09 | 12.5    | 6.2     | 18.3    | 7.0     | 928.8    | 68.2                  |
| 9/19/2017 11:23 | 12.7    | 6.1     | 18.4    | 6.9     | 915.4    | 65.0                  |
| 9/28/2017 12:06 | 12.4    | 6.4     | 18.3    | 7.2     | 975.0    | 67.8                  |
| 10/4/2017 12:28 | 12.3    | 6.2     | 18.3    | 7.0     | 968.8    | 67.0                  |
| 10/8/2017 12:13 | 13.0    | 5.8     | 18.9    | 6.5     | 912.9    | 57.9                  |
| 10/11/2017 12:41 | 12.0    | 7.0     | 18.3    | 8.1     | 979.9    | 69.8                  |
| 10/12/2017 11:17 | 12.4    | 6.9     | 18.5    | 7.8     | 964.7    | 67.4                  |
| 10/17/2017 11:52 | 12.7    | 6.5     | 18.5    | 7.3     | 914.2    | 66.0                  |
| 10/23/2017 12:14 | 12.6    | 6.5     | 18.4    | 7.3     | 922.3    | 67.5                  |
| 10/29/2017 12:27 | 13.4    | 5.8     | 19.1    | 6.5     | 854.2    | 55.6                  |
| 11/2/2017 12:32  | 13.1    | 5.7     | 18.8    | 6.3     | 838.2    | 59.2                  |
| 11/7/2017 11:02  | 12.5    | 6.4     | 18.6    | 7.2     | 975.5    | 64.7                  |
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