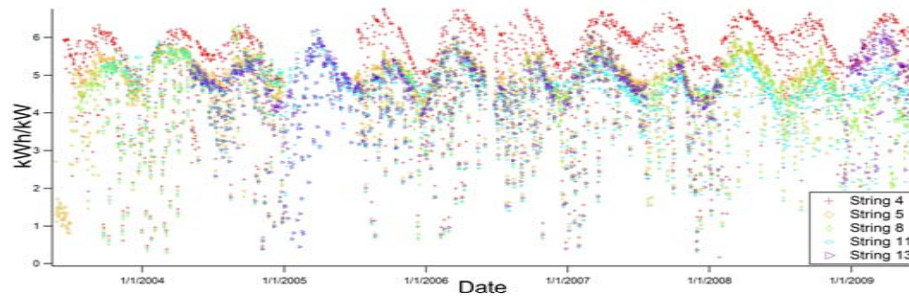


PV System Degradation in Southern Arizona

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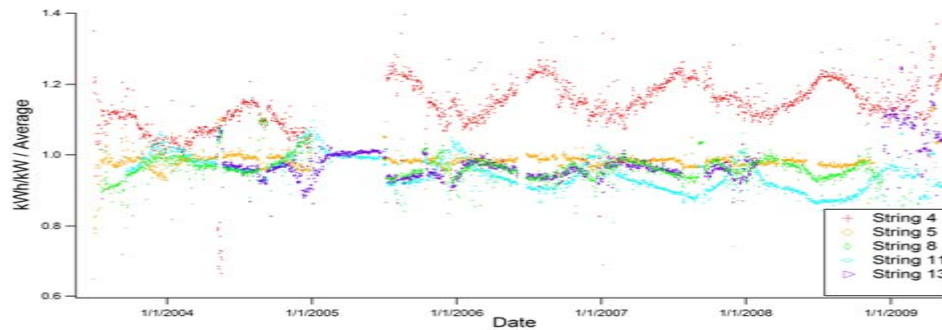
Using meter readings of AC power generated from PV modules, we want to find the change in power output over the system lifetime.

Energy output relative to manufacturer's power rating for some of the systems at the Tucson Electric Power (TEP) Solar Yard.

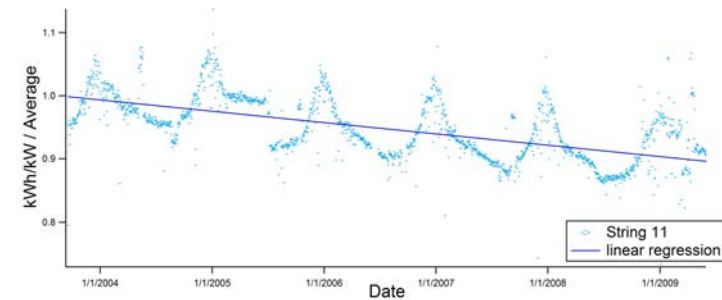


System Number (AKA String Number)	Panel Manufacturer	Construction Type	Inverter Manufacturer
4	Unisolar	Triple Junct. Si	Fronius
5	Sanyo	a-Si	Sunny Boy
8	BP Solar	Multi-Crystal	Xantrex
11	Shell Solar	CIS thin film	Xantrex
13	Shell Solar	Multi-Crystal	Sharp

The performance of each system relative to the average can then be calculated.



Here, String 11 declines by $.0179 \pm .0005$ per year



The long term performance of each system can then be ranked against the others.

String number	Average change per year
4	0.0170 ± 0.0010
13	0.0145 ± 0.0008
5	0.0066 ± 0.0009
8	-0.0156 ± 0.0008
11	-0.0179 ± 0.0005