Re: Low drift OP amp for photodiode circuit

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- *From*: Phil Hobbs <pcdhSpamMeSenseless@xxxxxxxxxxxxxxxxx>
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Robert Latest wrote:

> Phil Hobbs wrote:
>
> > There are lots of nice things about this method. One is that it's much much quieter at very high gains−−unlike 500G ohm resistors, capacitors don't have thermal noise.
>
> A 500G resistor has about 0.18fA/rtHz noise, that's about as much noise as a 0.1pA (leakage) current has intrinsically. So if your opamp is (and needs to be) better than that, use the integrator method.
>
> How does the LED reset method work? Using the LED as a photoswitch?
>
> I also like the supply reversal method conceptually but have never used it.
>
> robert

It's worse than that though−−don't forget the big noise peak caused by the input capacitance and the amplifier's input noise−−with a 500G resistor and a 3 pF input capacitance, the noise starts to rise linearly at 1 Hz! That doesn't exist with charge sensitive amps. And also the bandwidth can be quite different. If you use a capacitor across Rf to reduce the bandwidth to the same value you'd get by charge dispensing, you basically wind up with an integrator with a continuous resistive reset as opposed to a switched one.

Cheers,

Phil Hobbs
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