

Re: Transimpedance bandpass w/o inductors?

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From: Product developer (jdurban_at_vorel.com)

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acannell@wwc.com (Asa Cannell) wrote in message
news:<51ca721c.0409241552.3ab77fe7@posting.google.com>...

> *I am trying to design a transimpedance circuit for very high
> sensitivity. I have pulled a circuit directly out of the OPA129
> datasheet. Its a basic transimpedance configuration using a 1Gohm
> resistor for feedback. I have built the circuit and am very impressed
> by how sensitive it is. However, it is useless in any kind of ambient
> light whether static (sunlight) or dynamic (flourescents at 60hz). I
> need a way to block low frequency (DC to 60Hz) signals.*

Flourescents lights also put out a lot of 120 hz

>
> *I thought about putting an inductor in the feedback loop, but I don't
> think they make inductors with an impedance equal to a 1Gohm resistor
> at around 1khz.*
>
> *I tried putting a capacitor in series with the input, and this blocks
> DC, but the photodiode will easily saturate in sunlight or other
> static light sources.*
>
> *I was thinking there might be some way to make a bandpass
> transimpedance amplifier and maintain my 1Gohm feedback resistance,
> without using inductors. Anyone done this?*
>
> *I am using this for outdoors flourosopy (of oil), it will be facing
> concrete and/or fairly level water in bright sunlight, so it needs to
> be very immune to strong DC signals.*
>
> *The signal will be at ~1khz. (its a pulsed uv light)*

Forget all the filtering and just a Schott or similar pass band
optical filter centered on your source's wavelength or use a high
quality low pass optical to cut off everything above your source's
maximum wavelength of interest.

If you are pulsing your source are you also using a reference from
your modulator or chopper to provide a reference for lock-in or
synchronous detection and recovery of the incident light? If so you

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will inherently remove most all of any residual artifacts from indoor or outdoor sources.

I have designed an oil contamination system for a client years ago but it was a transmissometer-based design looking at a specimen sheet with the oil under test in assigned locations on a sheet of absorptive analytical paper. Based on absorption at proprietary wavelengths the oil's level of contamination was measured.

There is considerable prior art regarding devices that look at oil using spectrophotometry in both transmissive and reflective geometries.

>

>

> *Asa*