Feedback analysis of transimpedance operational amplifier circuits

The transimpedance or current feedback operational amplifier (CFB op-amp) is reviewed and compared to a conventional voltage mode op-amp using an analysis emphasizing the basic feedback characteristics of the circuit. With this approach the paradox of the constant bandwidth obtained from CFB op-amps is explained. It is demonstrated in a simple manner that the constant gain-bandwidth product of the conventional op-amp and the constant bandwidth of the CFB op-amp are both in accordance with basic feedback theory and that the differences between the traditional op-amp and the CFB op-amp are due to different ways of controlling the closed-loop gain. For the traditional op-amp the closed-loop gain is altered by altering the loop gain, whereas the closed-loop gain in a CFB op-amp configuration is altered by altering the input attenuation to the feedback loop while maintaining a constant-loop gain.

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