



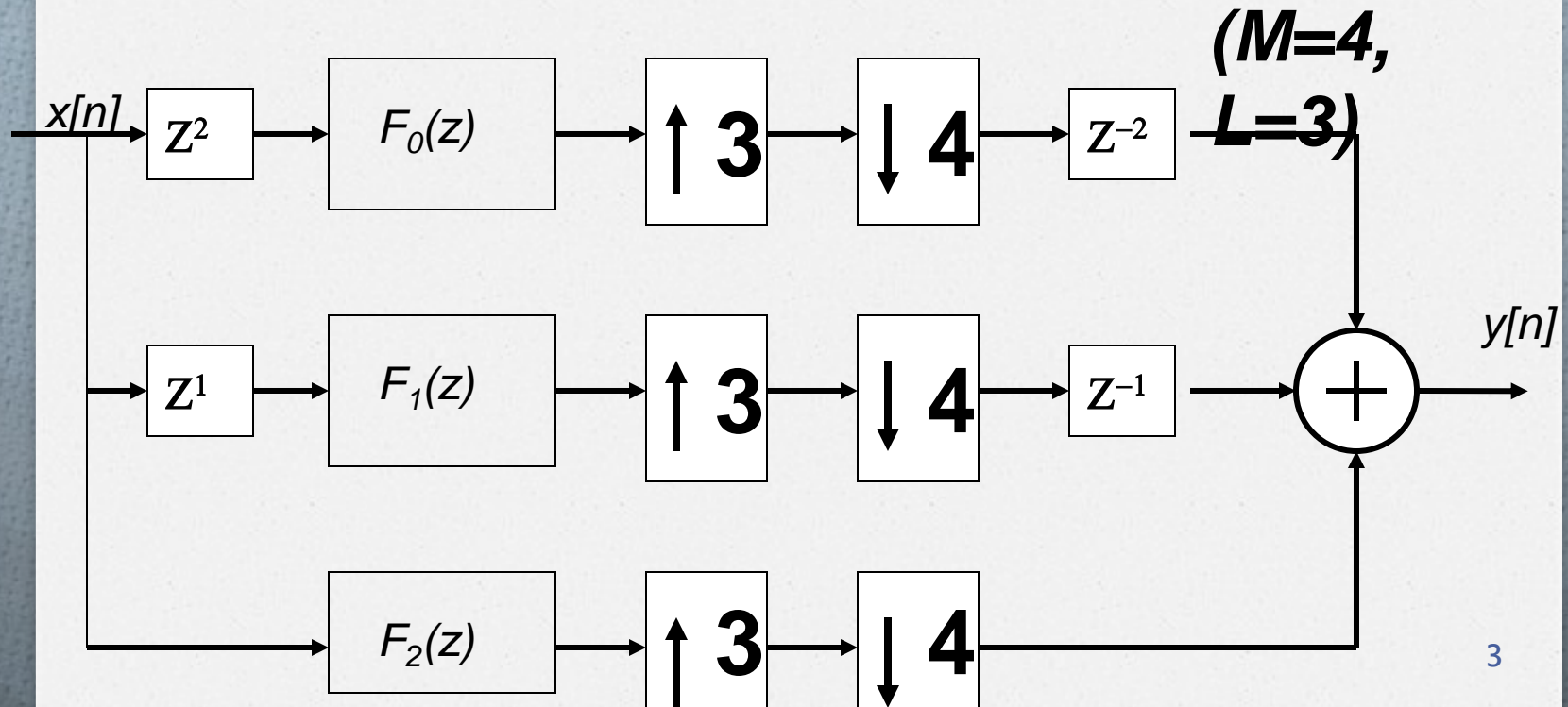
Digital Signal
Processing- Lecture 19

Topics to be covered:

- Fractional Sampling rate filter

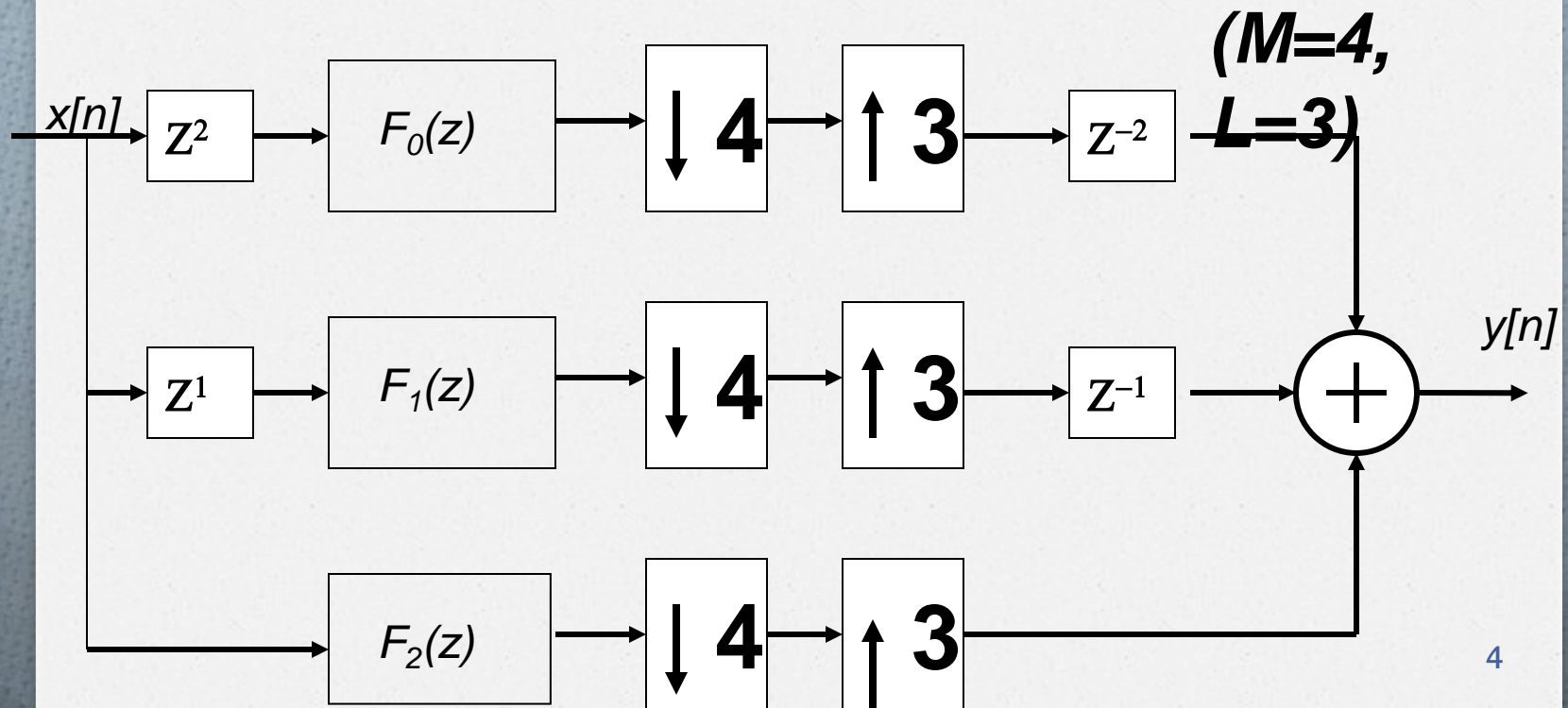
Poly-phase Structure of Fractional Sampling Rate Filter

$$H(z) = z^2 F_0(z^3) + z^1 F_1(z^3) + F_2(z^3)$$



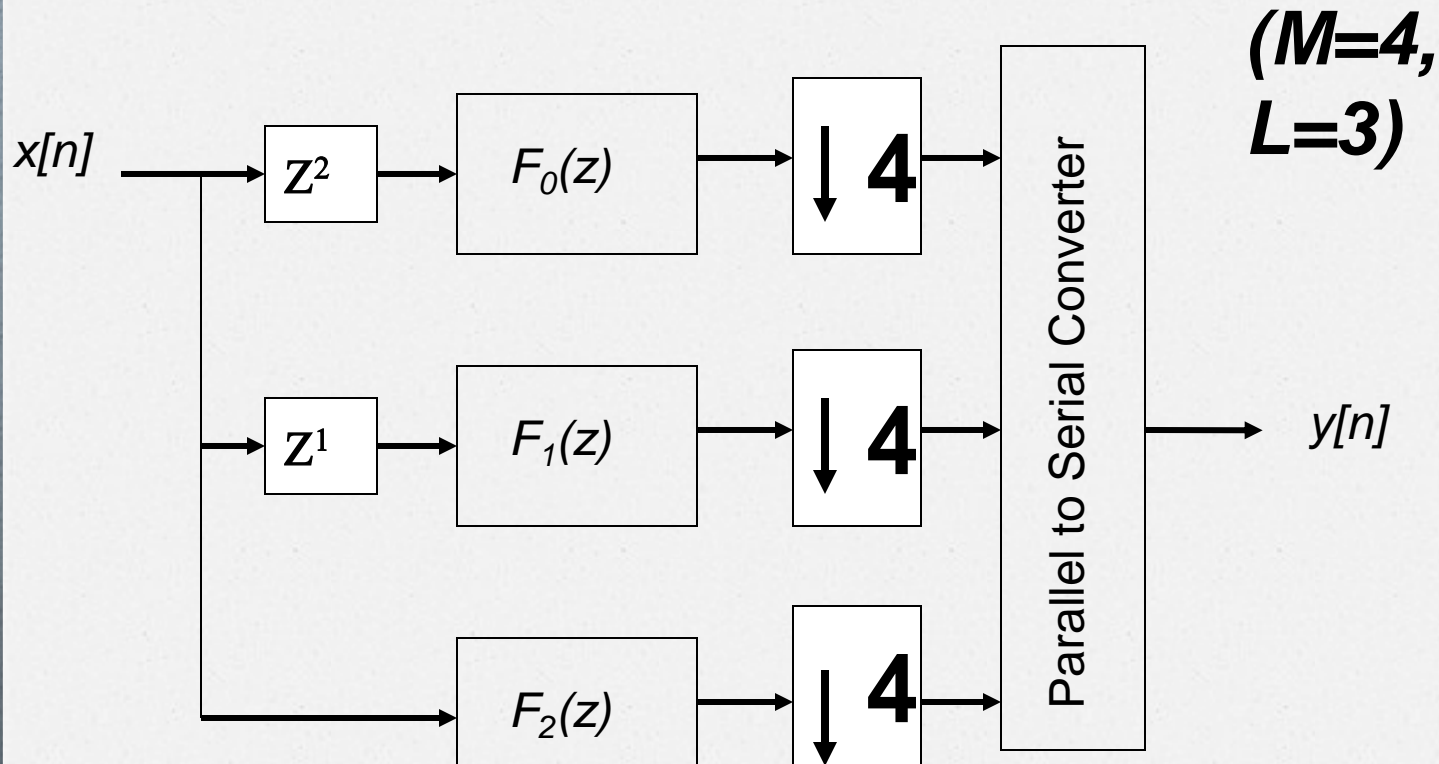
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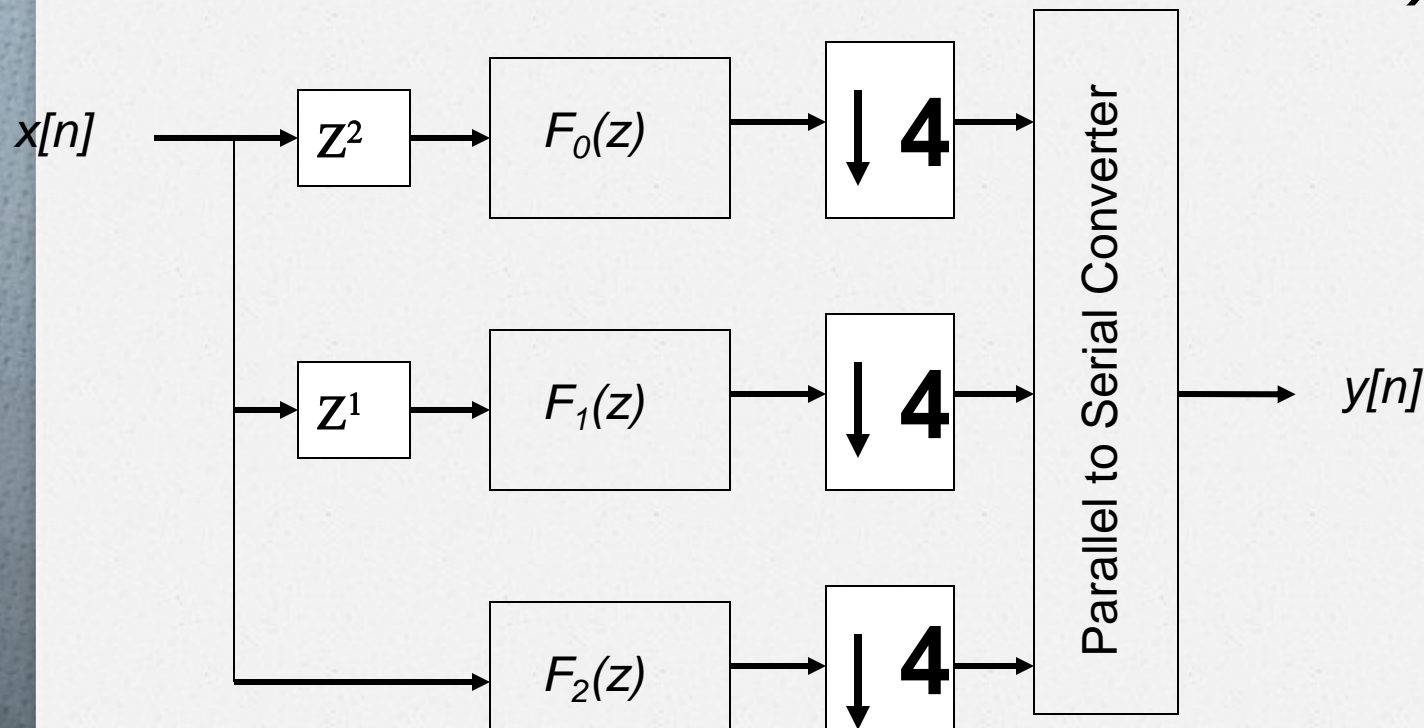


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$$F_k(z) = F_{k0}(z^4) + z^1 F_{k1}(z^4) + z^2 F_{k2}(z^4) + z^3 F_{k3}(z^4)$$

**(M=4,
L=3)**

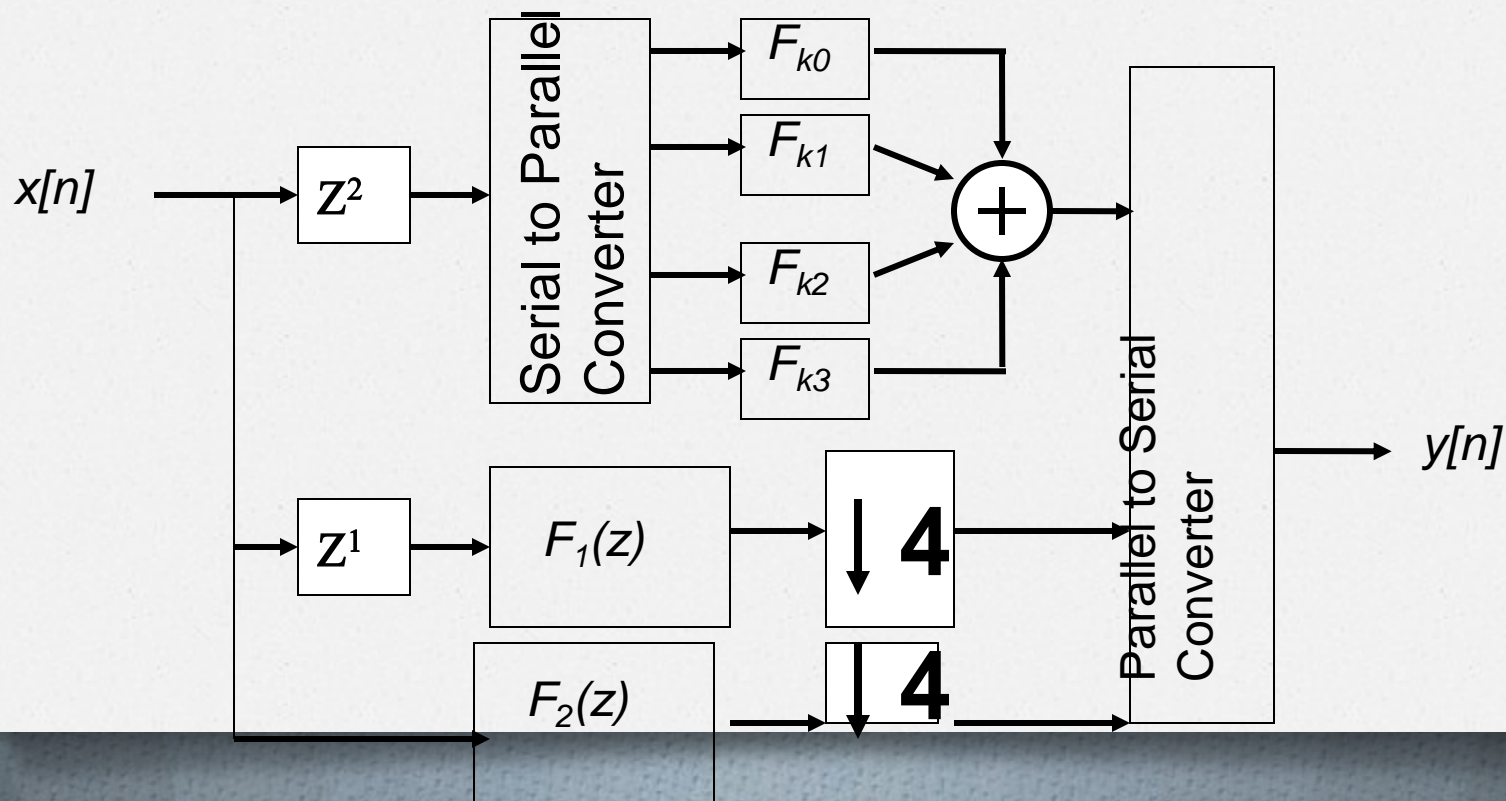


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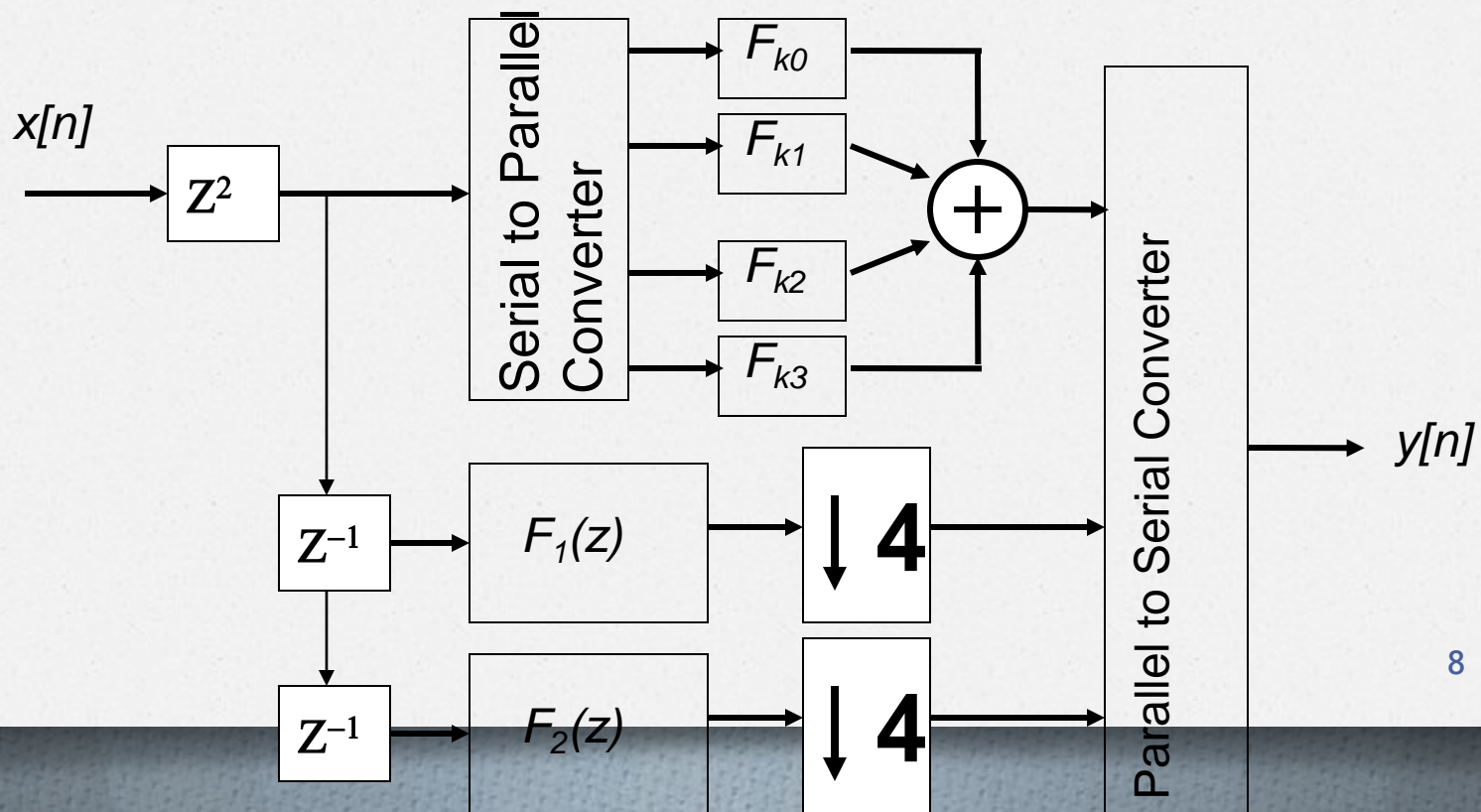


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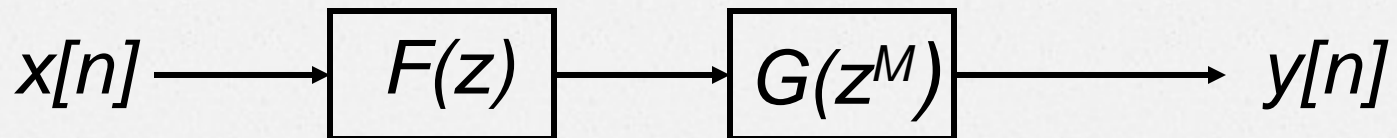
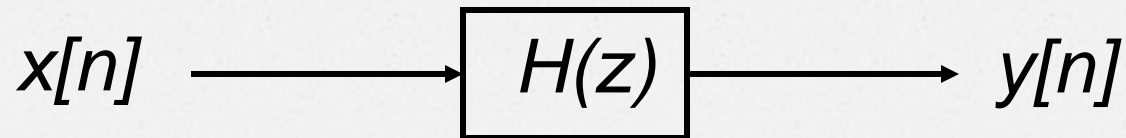
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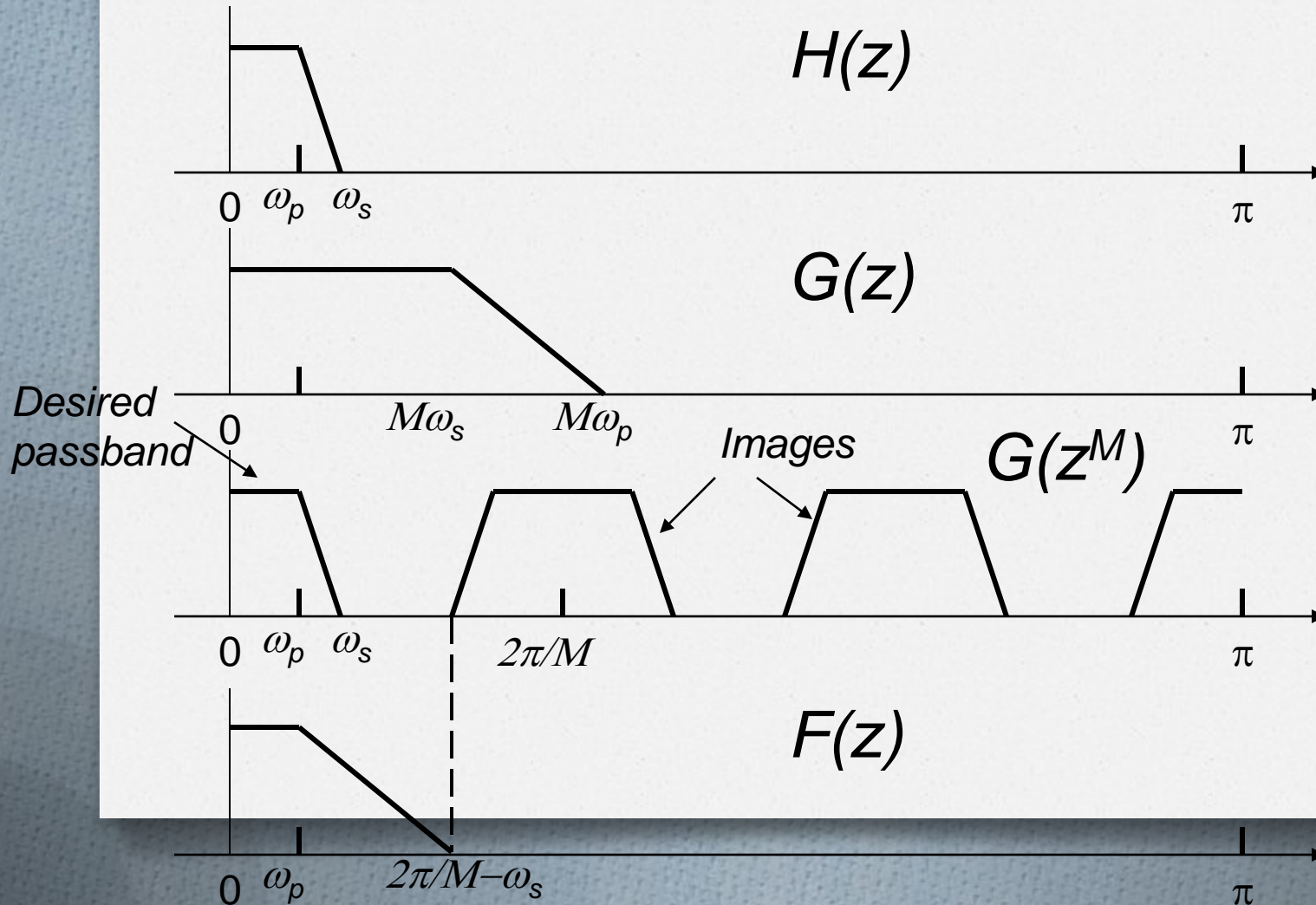
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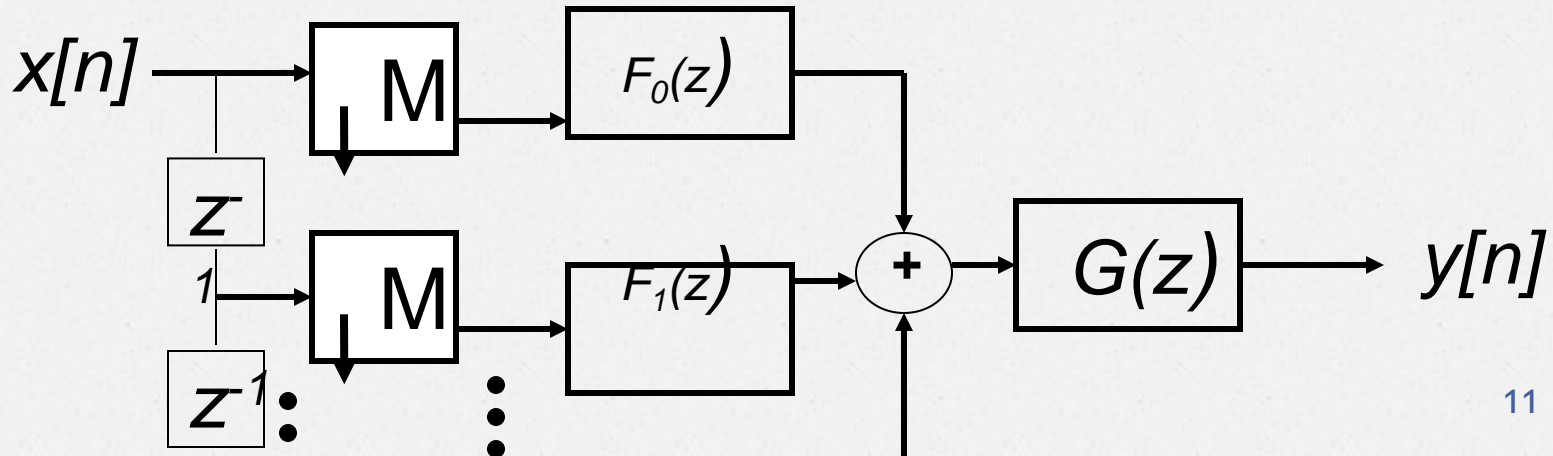
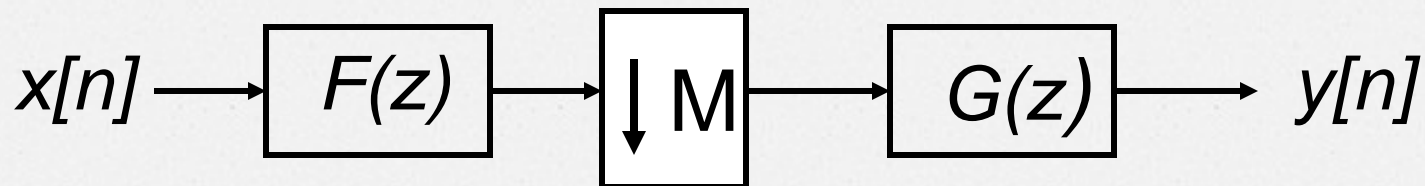
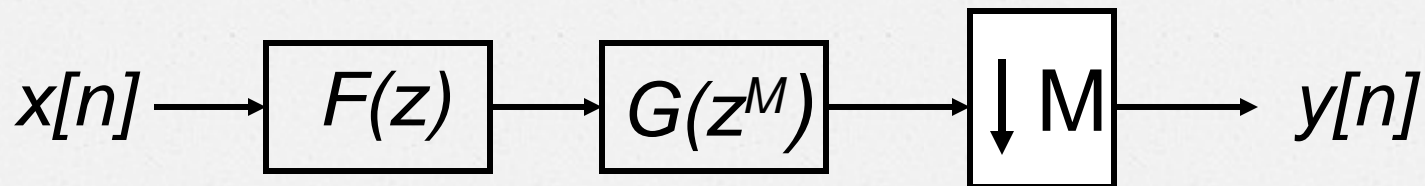
Efficient Design for Very Narrow-band Filters



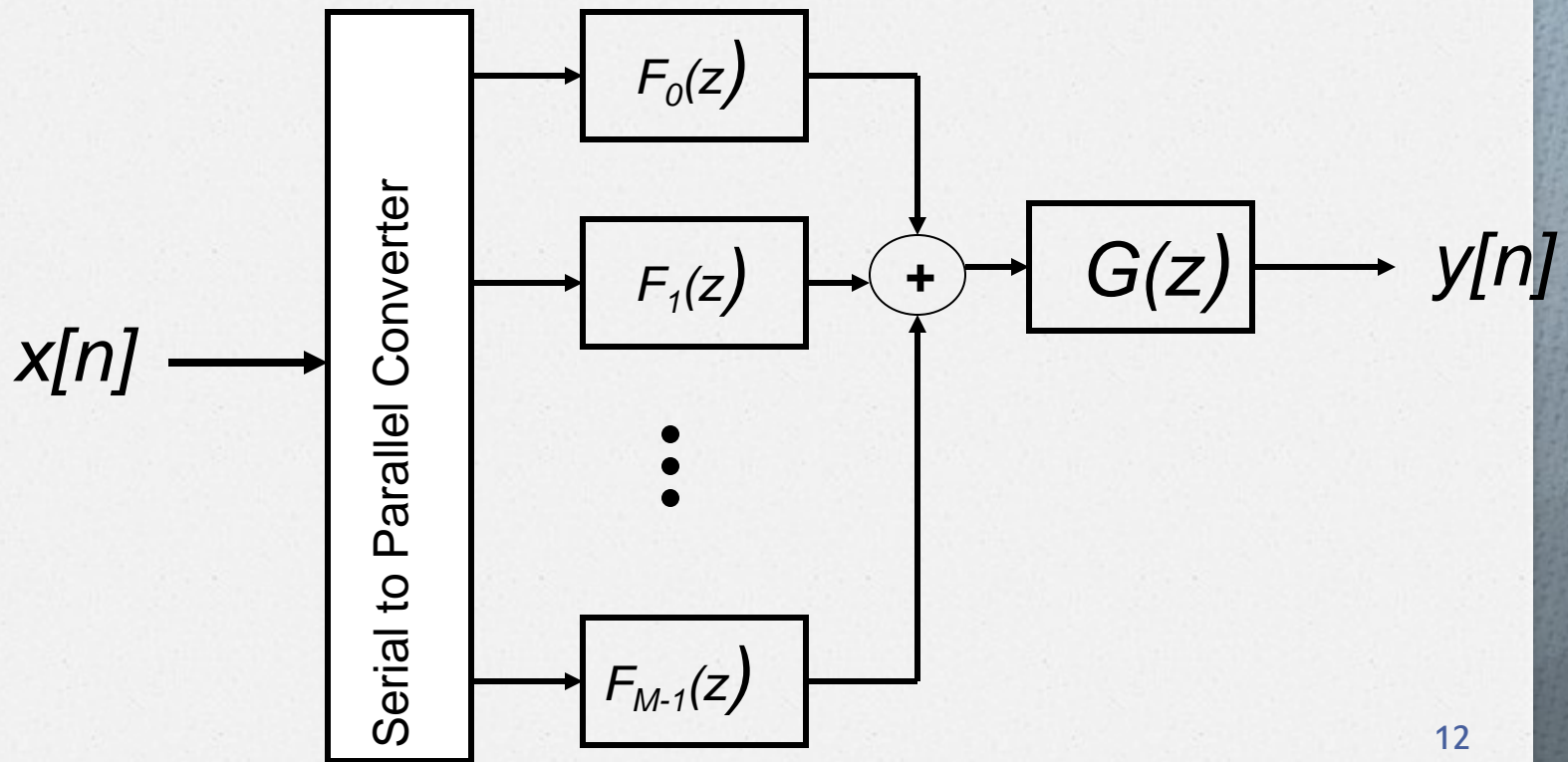
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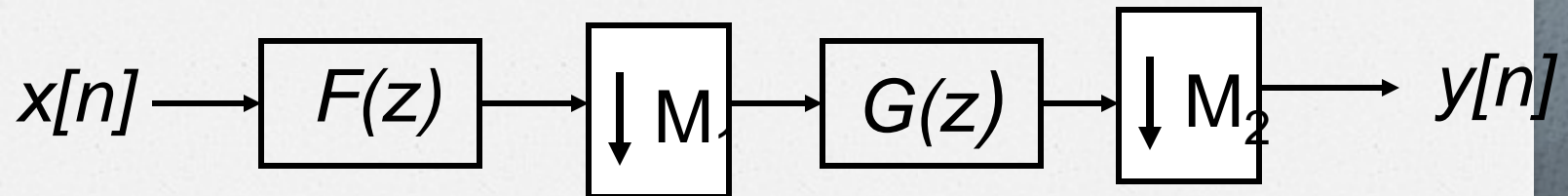
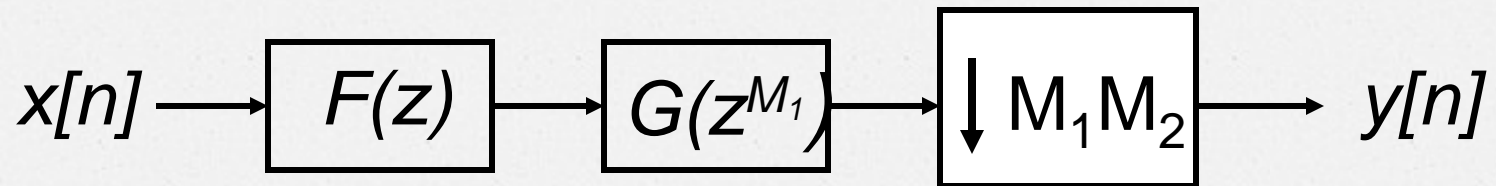
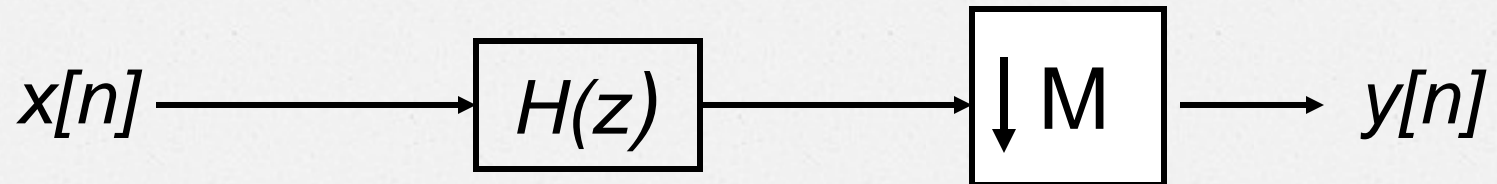
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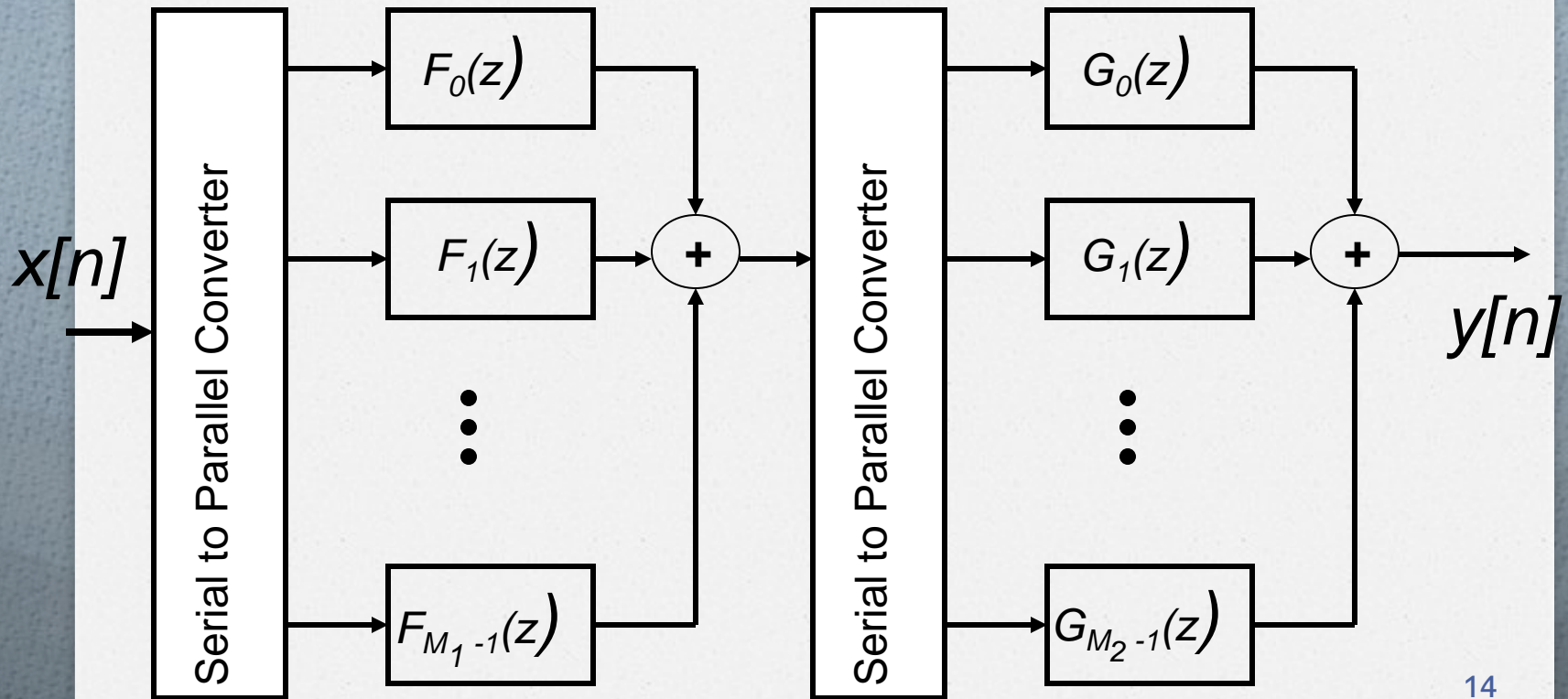
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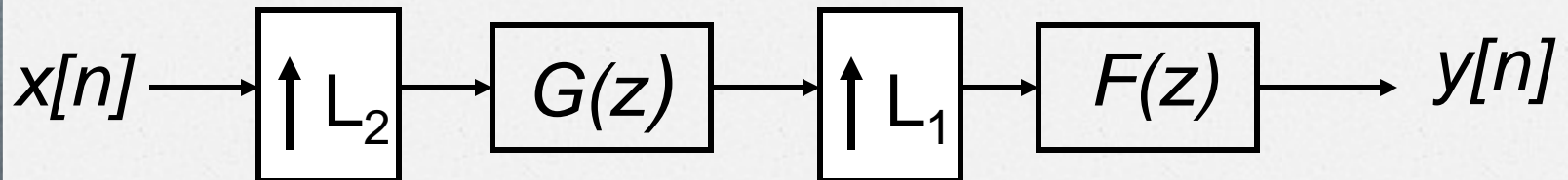
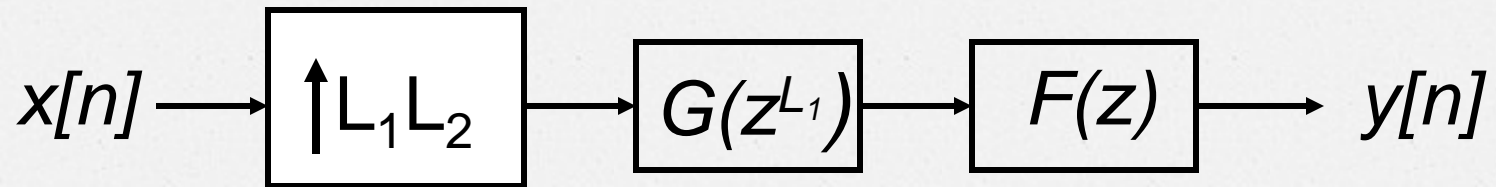
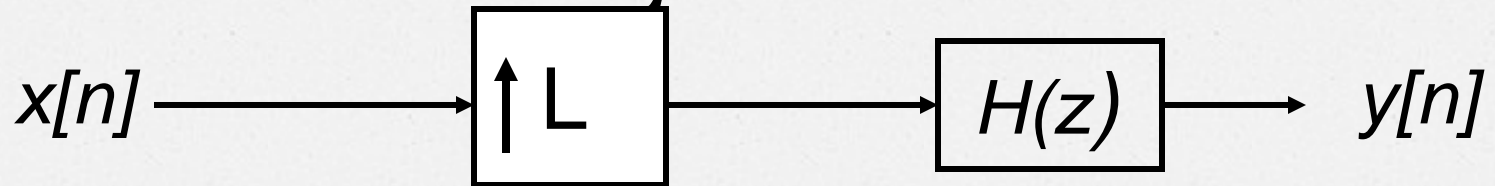
Multi-stage Decimation System



Multi-stage Decimation System



Multi-stage Interpolation System



Multi-stage Interpolation System

