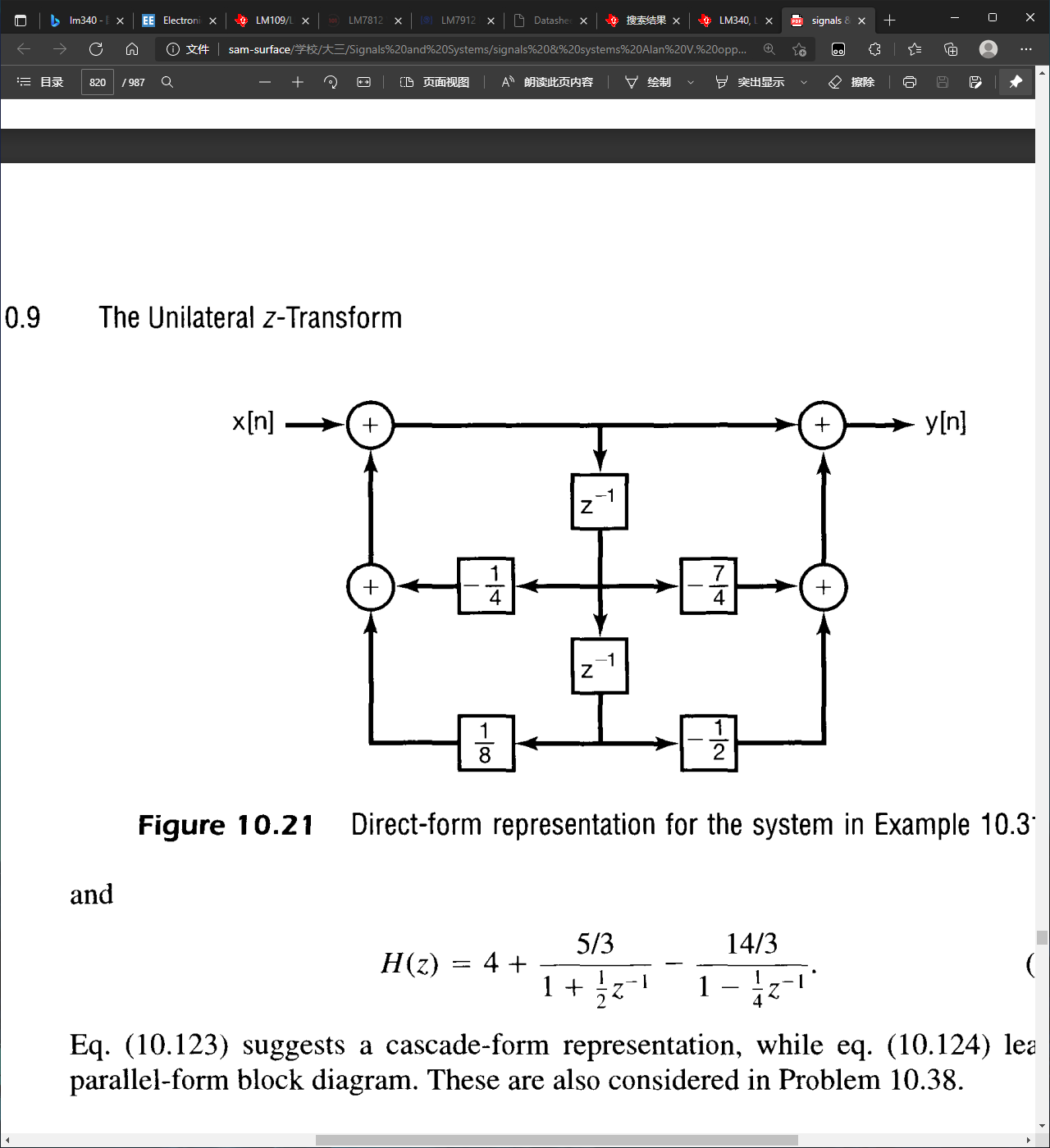
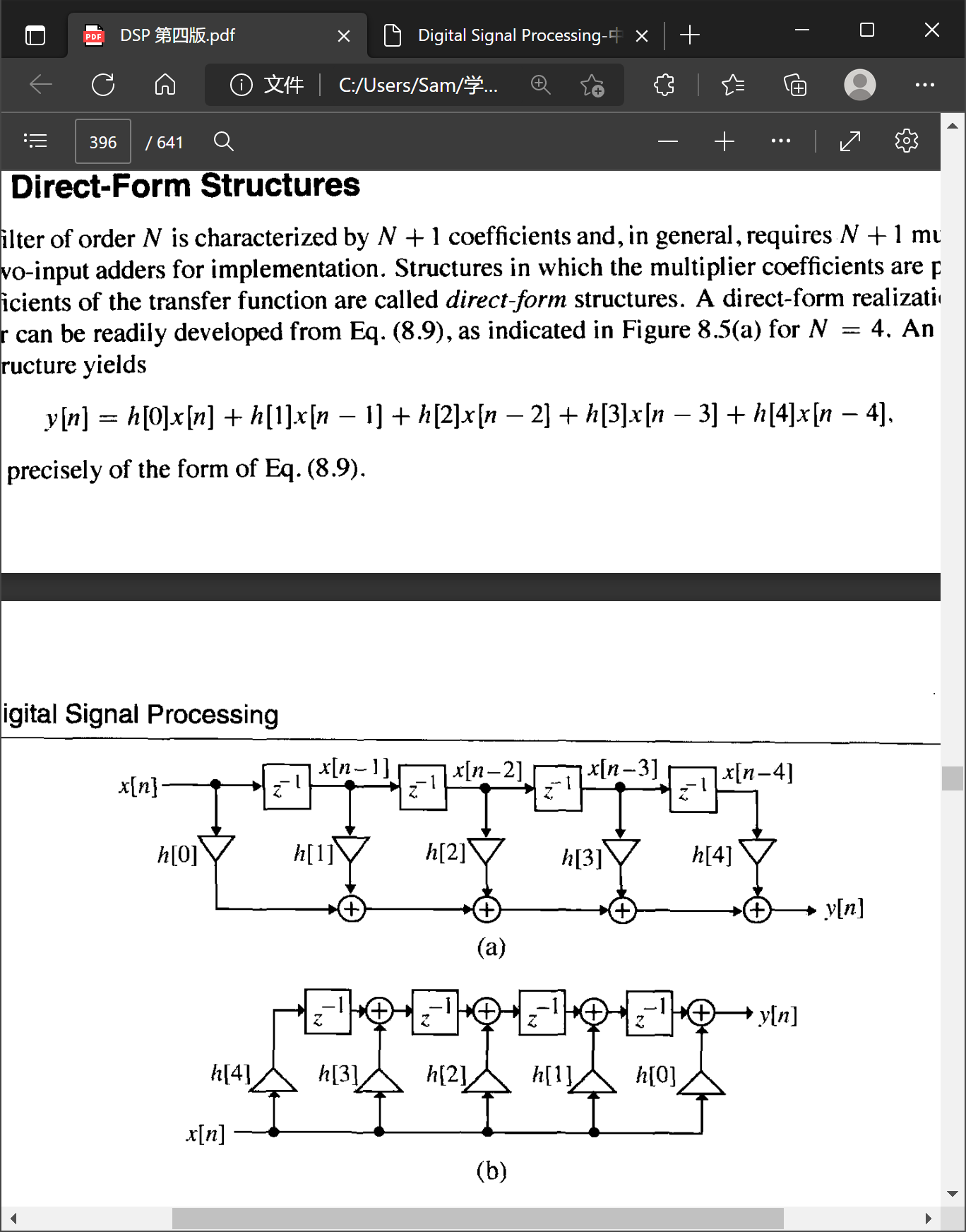


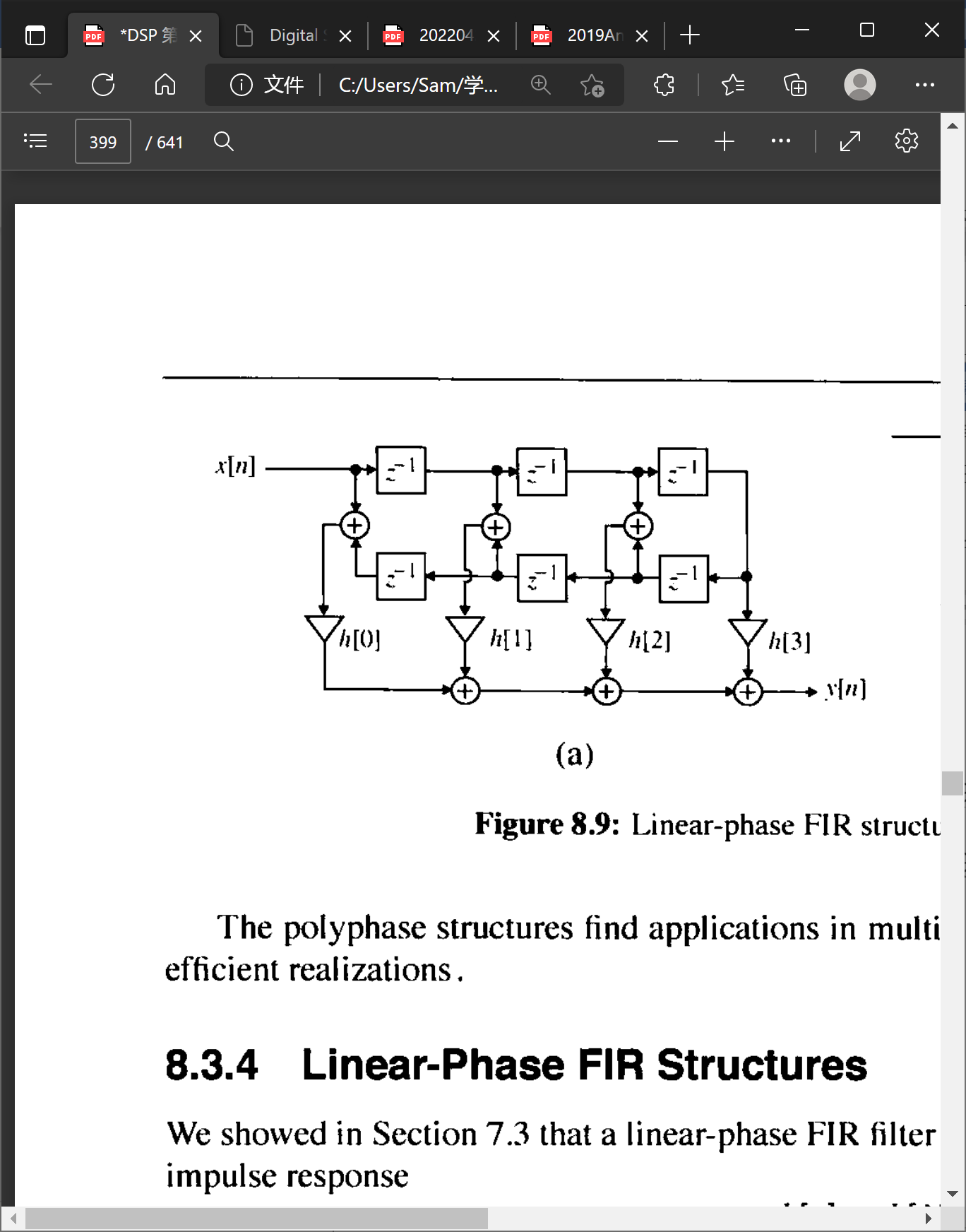
**IIR Direct Form II**

,



**FIR Direct Form & Linear Phase**





**DFT Transform Pairs**

|  |  |
| --- | --- |
| **Signal** | **Transform** |
|  |  |
|  |  |
|  |  |
|  |  |

**Butterworth Filter**

**DFT关键公式**

**DTFT Transform Pairs**

|  |  |
| --- | --- |
| **Signal** | **Transform** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**Z-Transform Pairs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Signal** | **Transform** | | **ROC** |
|  |  | | All |
|  |  | |  |
|  |  | |  |
|  |  | All , except 0 or | |
|  |  | |  |
|  |  | |  |
|  |  | |  |
|  |  | |  |
|  |  | |  |
|  |  | |  |
|  |  | |  |
|  |  | |  |

**IIR Filter Design**

①对比两个选窗

②算

③

④

**P-Series Test**

converges

for

**Theorems**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Property** | **Signal** | **DTFT** | **DFT** | **Z-Transform** | **ROC** |
| Linearity |  |  |  |  | At least |
| Time Shifting |  |  |  |  | except for possible origin |
| Frequency Shifting  (Z-Domain Scaling) |  |  |  |  |  |
| Time Expansion |  |  |  |  |  |
| Convolution |  |  |  |  | At least |
| Multiplication |  |  |  |  | At least |
| Differencing in Time |  |  |  |  | At least |
| Accumulation |  |  |  |  | At least |
| Differentiation in Frequency |  |  |  |  |  |

**变换**

|  |  |  |  |
| --- | --- | --- | --- |
| **CTFT** | **DTFT** | **DFT** | **Z-transform** |
| 时域连续非周期 频域连续非周期 | 时域离散非周期 频域连续周期 | 时域离散周期 频域离散周期 |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  | with inverted |