

# Integrator with LPE demo

[LPE supported integrator](#) • [Supported LPE grammar](#) • [Get LPE complement image at integrator level](#)

## 1 LPE supported integrator

- Direct integrator
- Path mats tracer
- Path mis tracer( with per-lobe NEE)

## 2 Supported LPE grammar

### 2.1 Events

LPE Events	Description	Note
R	Reflection	
T	Transmission	
D	Diffuse	
G	Glossy	
S	Delta	
E	Emitter	
V	Volume	LPE engine supported. Haven't been validated with scene

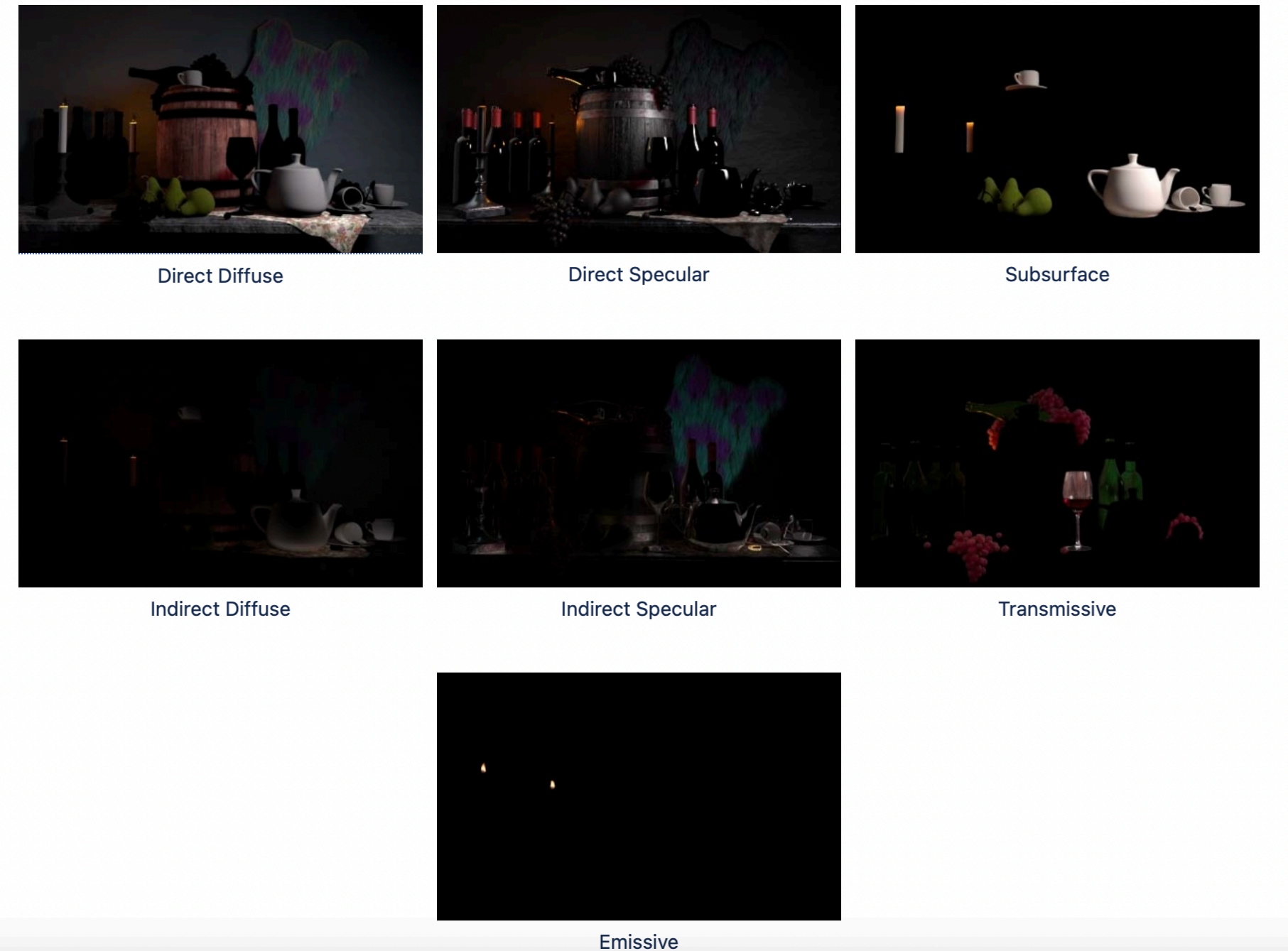
### 2.2 Constructing expressions

- The precedence from high to low is quantifiers (? , \\*, +, {}), concatenation, alternatives(|, [])

Expression	Description	Note
AB	Accepts first A, then B	
A B	Accepts A or B	
A?	0 or 1 occurrence of A	
A*	0 or more occurrence of A	
A+	1 or more occurrence of A	
.	Any event. A wildcard in any position	
[ ^A ]	Accept not A	LPE engine supported. Haven't been validated with scene
[ABC]	Matches tokens in the alphabet {A,B,C} in any quantity or sequence.	LPE engine supported. Haven't been validated with scene

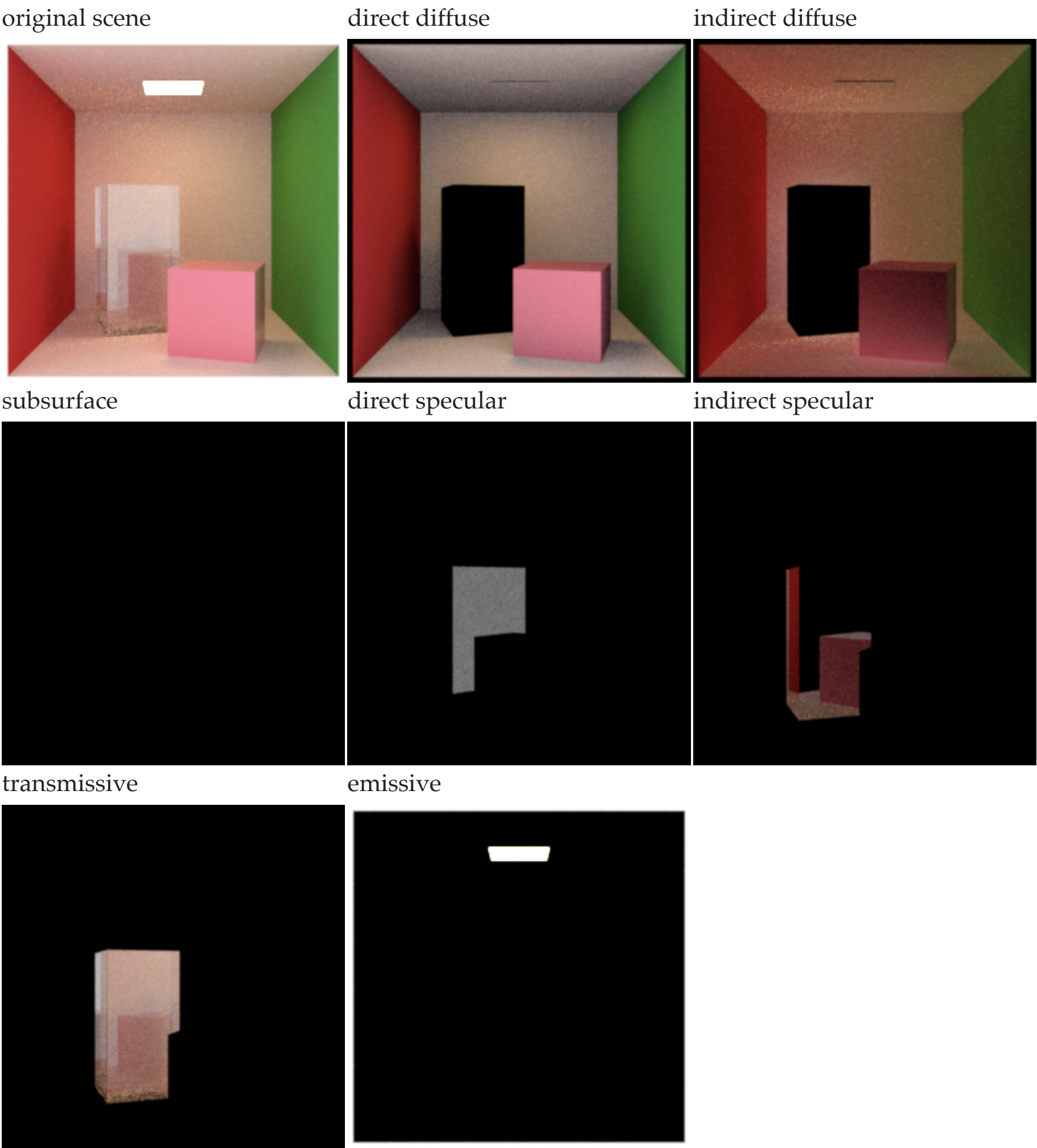
### 2.3 Summary of typical LPEs

- The following LPEs are given by Pixar's RenderMan.



Description	emissive	direct diffuse	indirect diffuse	subsurface	direct specular	indirect specular	transmissive
LPE	E	DRE	DR.+E	DT.*E	SRE	SR.+E	ST.*E

- Corresponding image are provided with path mis tracer(max\_depth=10). The large box is dielectric (has DeltaReflection and DeltaTransmission), the small box is rough plastic (has GlossyReflection and DiffuseReflection). All other parts of the scene are diffuse(including the emitter)



## 3 Get LPE complement image at integrator level

- Just set the “complement” as True when setting the integrator.

```
integrator = mi.load_dict(  
    {  
        'type': 'pmisLPE',  
        'lpe': 'S.D.*E',  
        'complement': True,  
    })
```

- Example

