

フェルミ粒子

	第1世代	第2世代	第3世代
クォーク	u アップ クォーク	c チャーム クォーク	t トップ クォーク
	d ダウントク クォーク	s ストレンジ クォーク	b ボトム クォーク
レプトン	e 電子	μ ミュー粒子	τ タウ粒子
	ν_e 電子 ニュートリノ	ν_μ ミュー ニュートリノ	ν_τ タウ ニュートリノ

ゲージ粒子



Pre-preparatory Phase

Main Preparatory Phase

Construction / Operation Phase

政府間議論

政府間交渉

ILC Laboratory

European Strategy for
Particle Physicsのアップデート

日本学術会議のマスタープラン

ILCの活動

- LCB / LCC
- KEK Planning Office for ILC etc.

政府間交渉の開始

政府間合意

ILC準備研究所

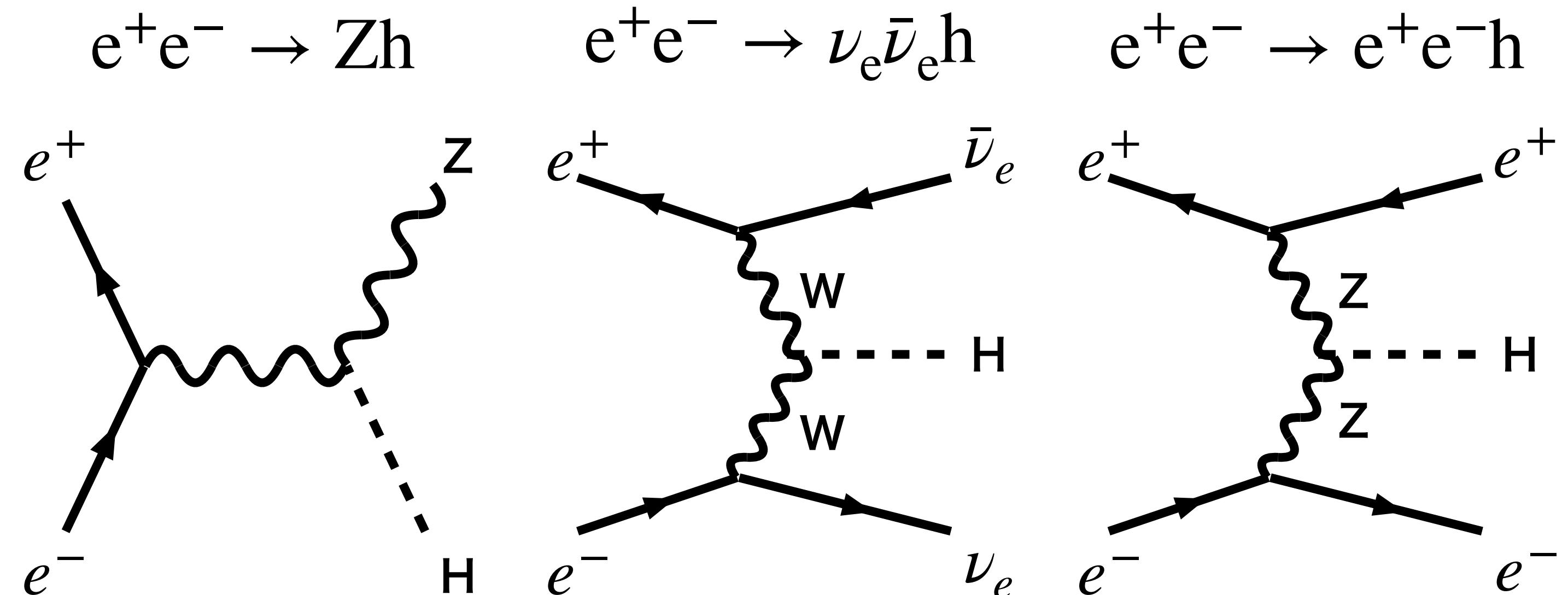
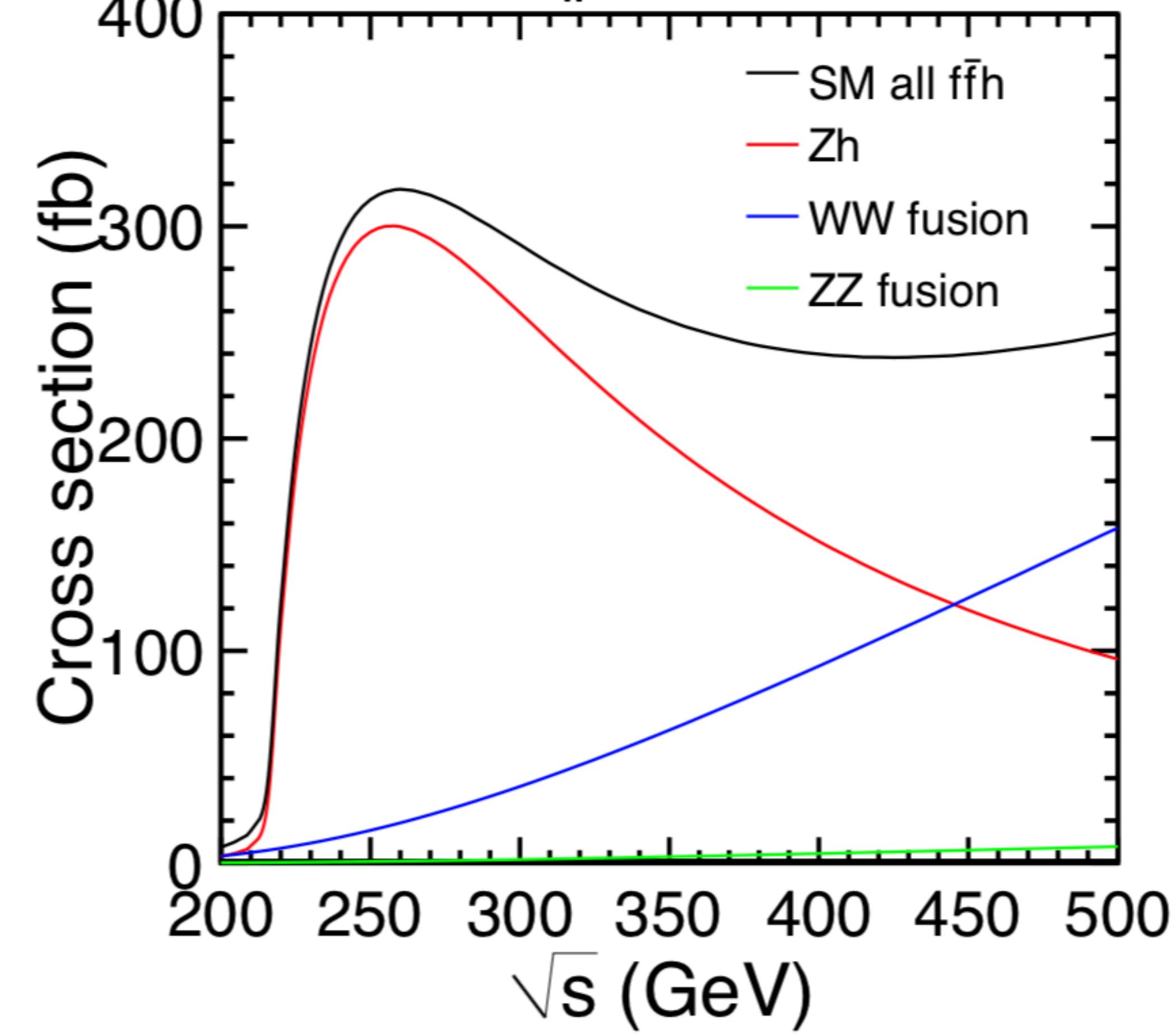
Light-weight
MoUs

Detailed
MoUs

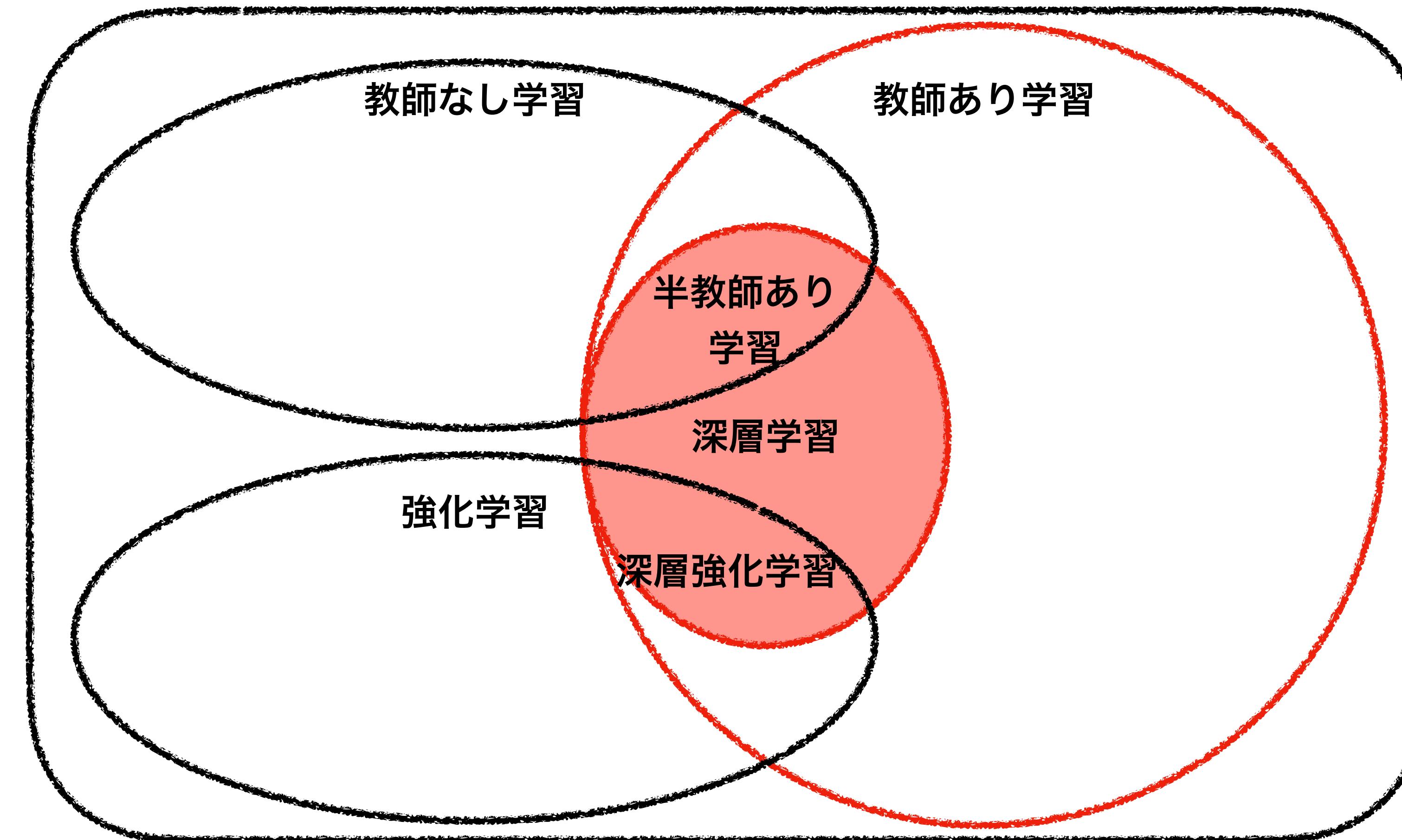
建設

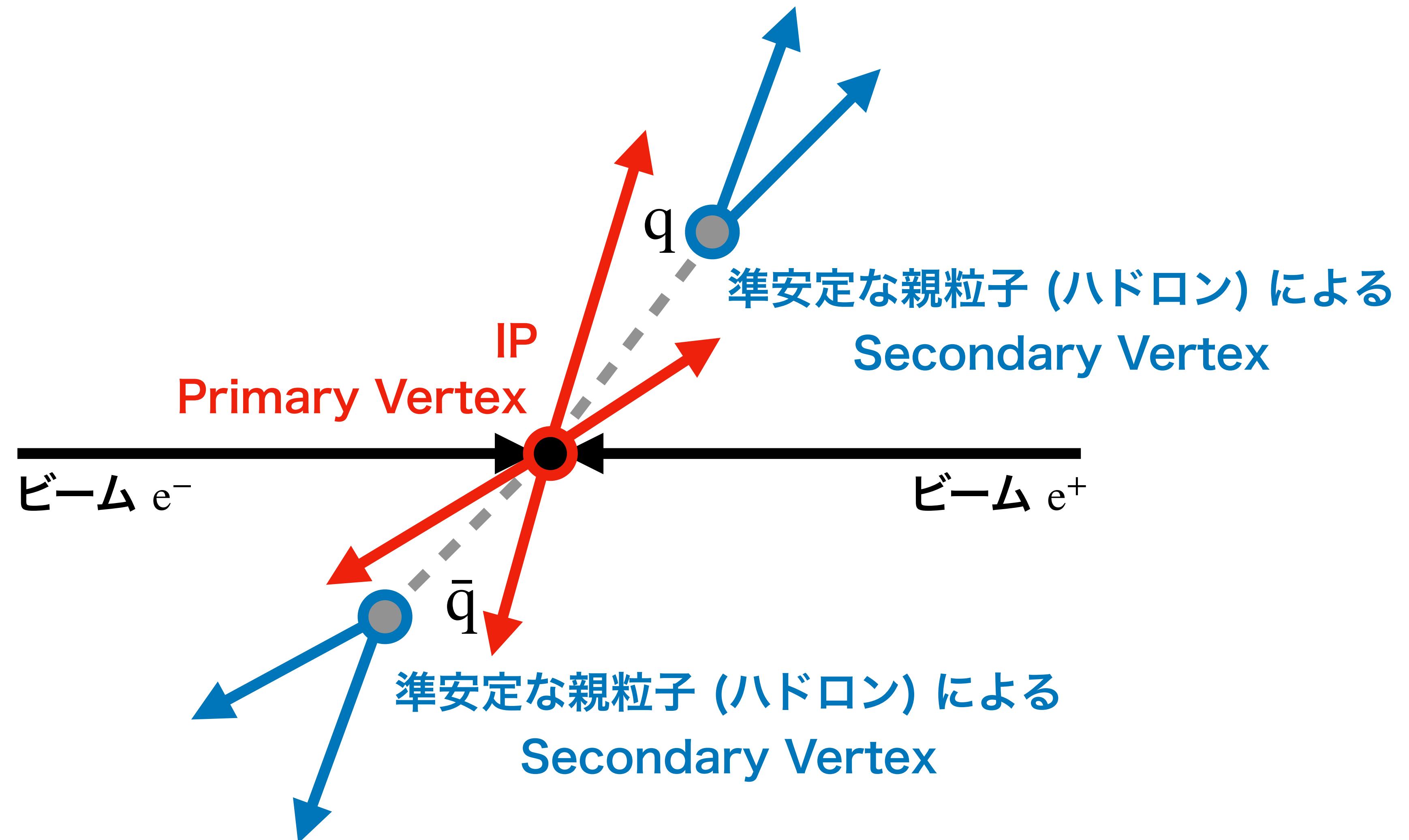
運転

$P(e^-, e^+) = (-0.8, 0.3)$, $M_h = 125 \text{ GeV}$

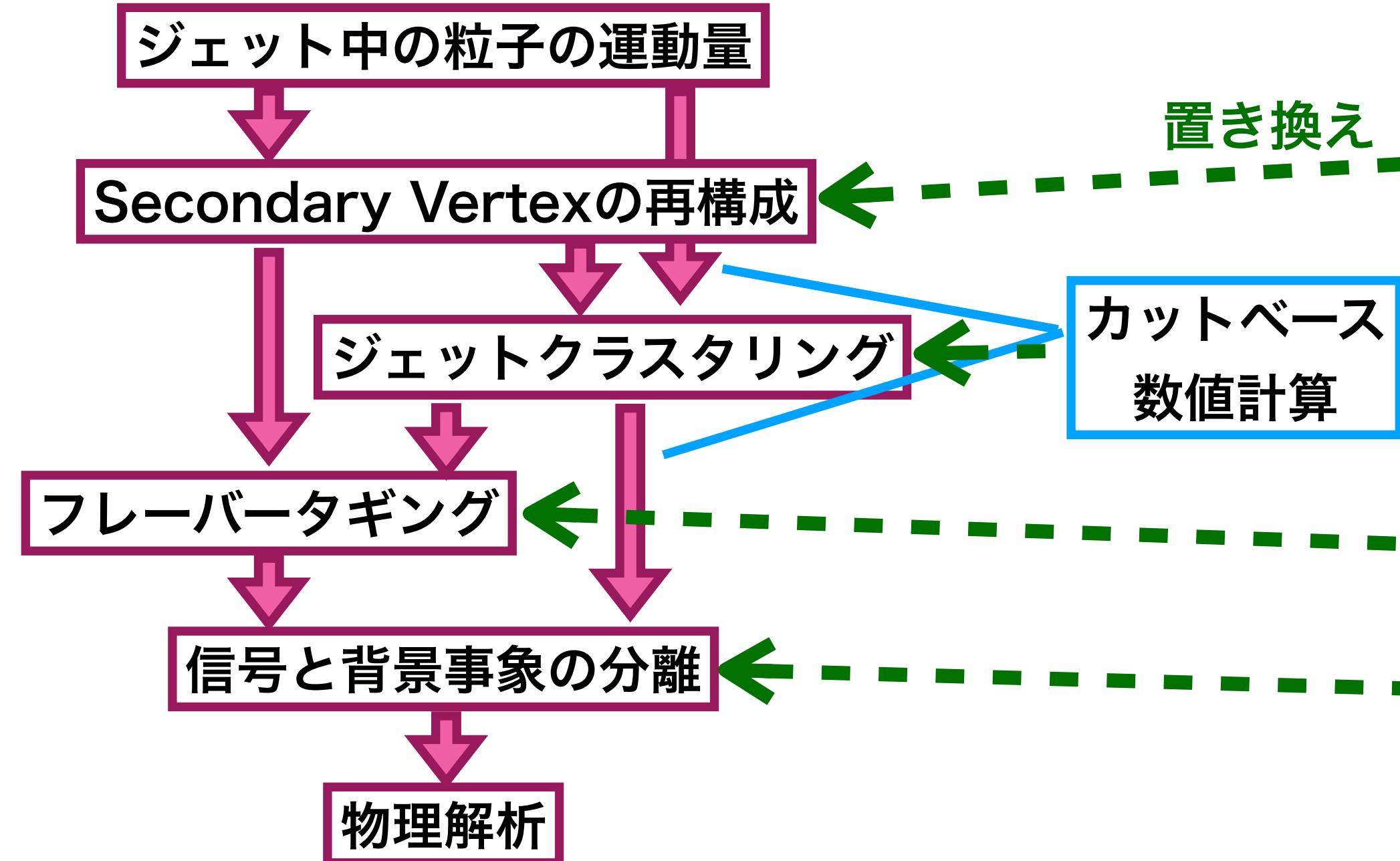


機械学習

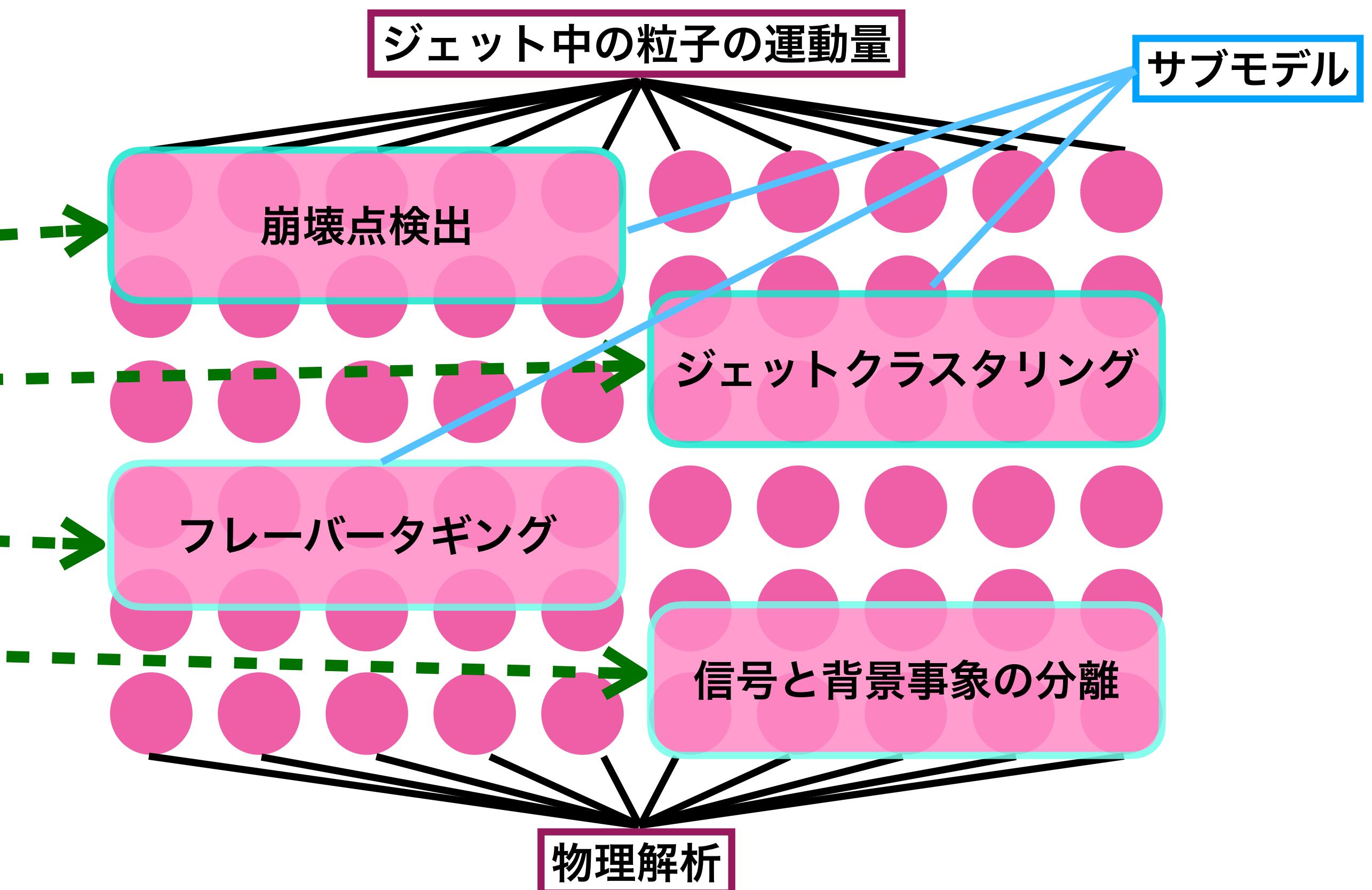


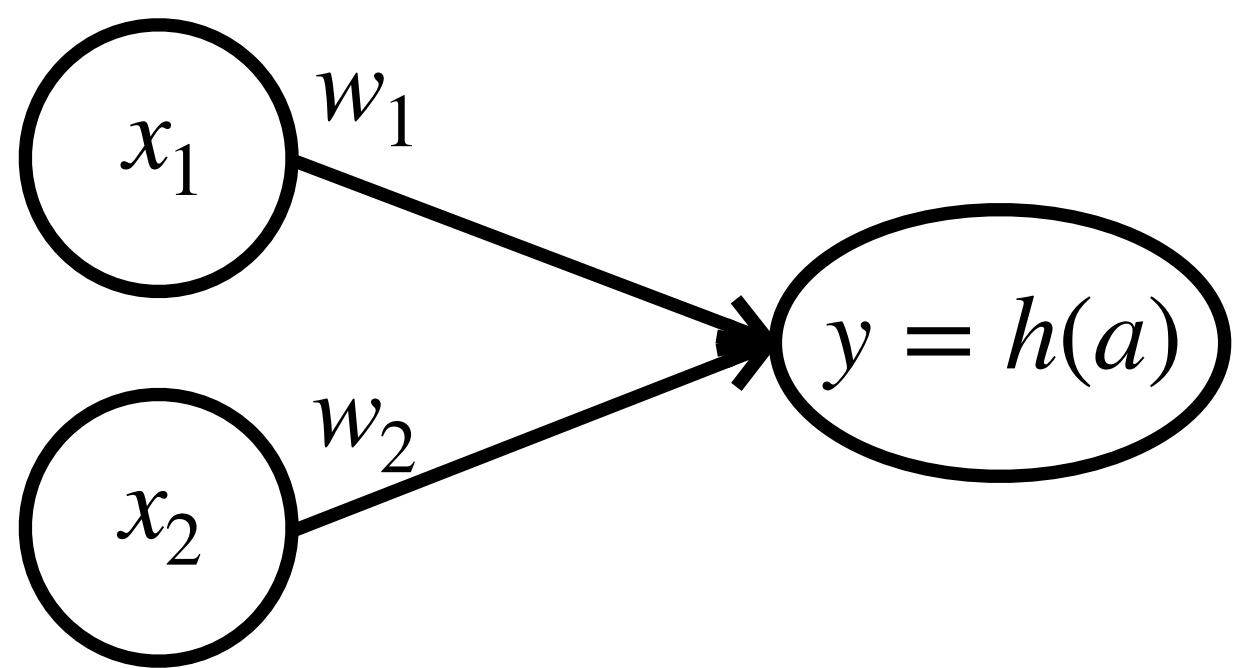


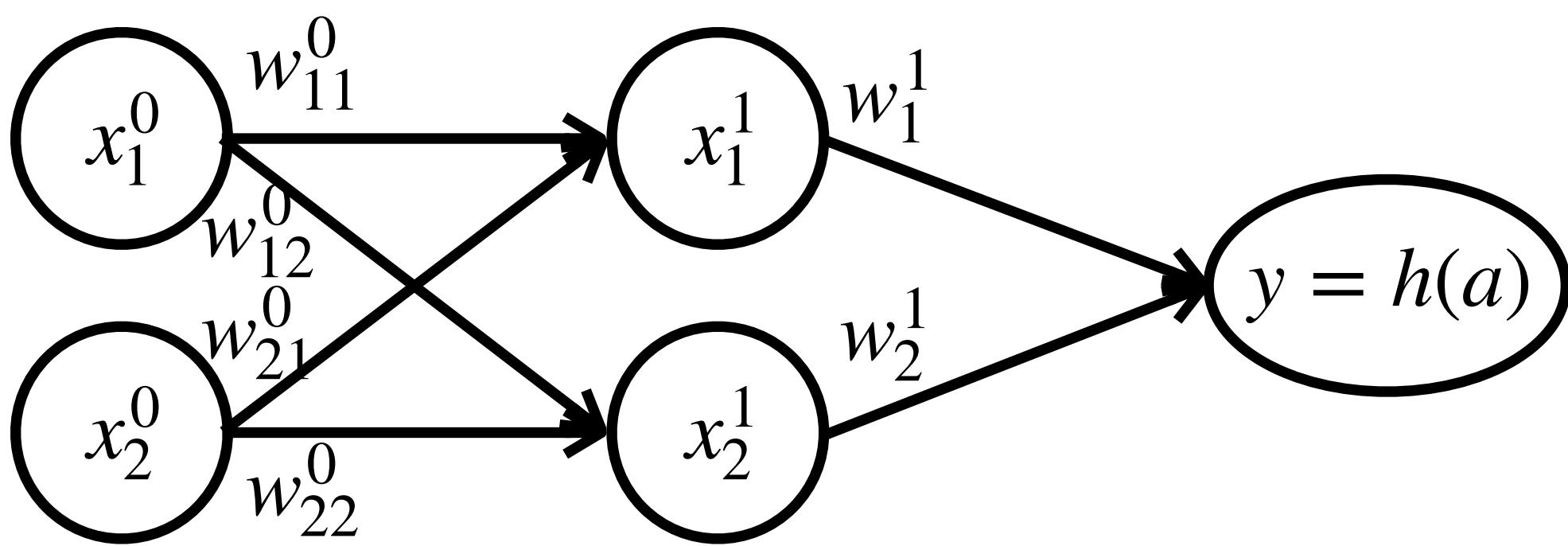
現行の手法



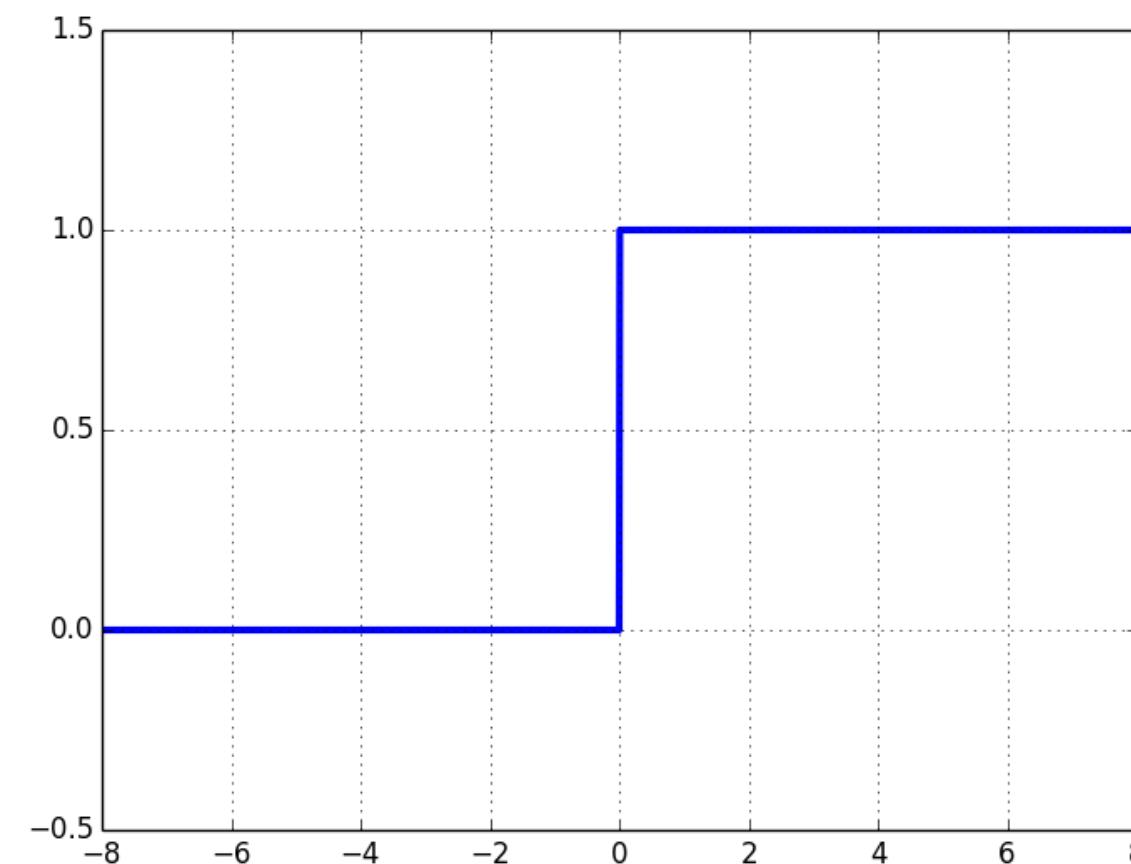
深層学習



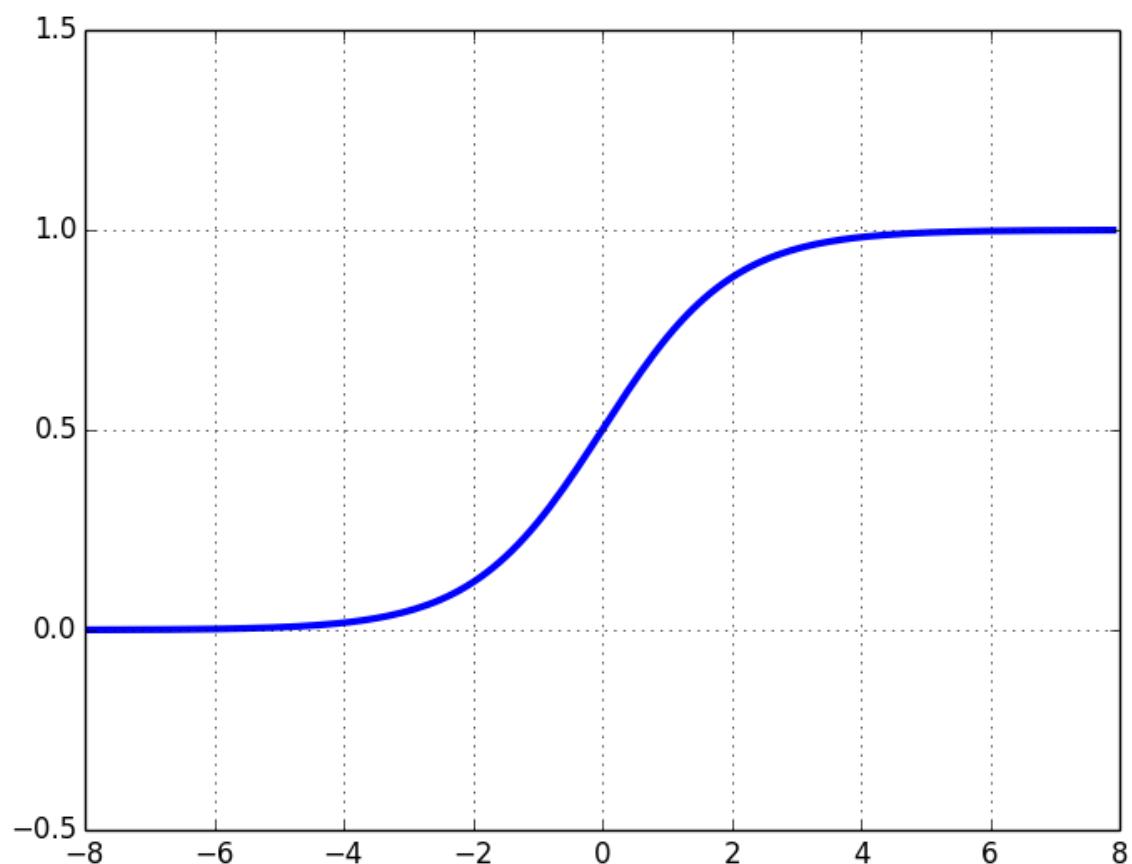




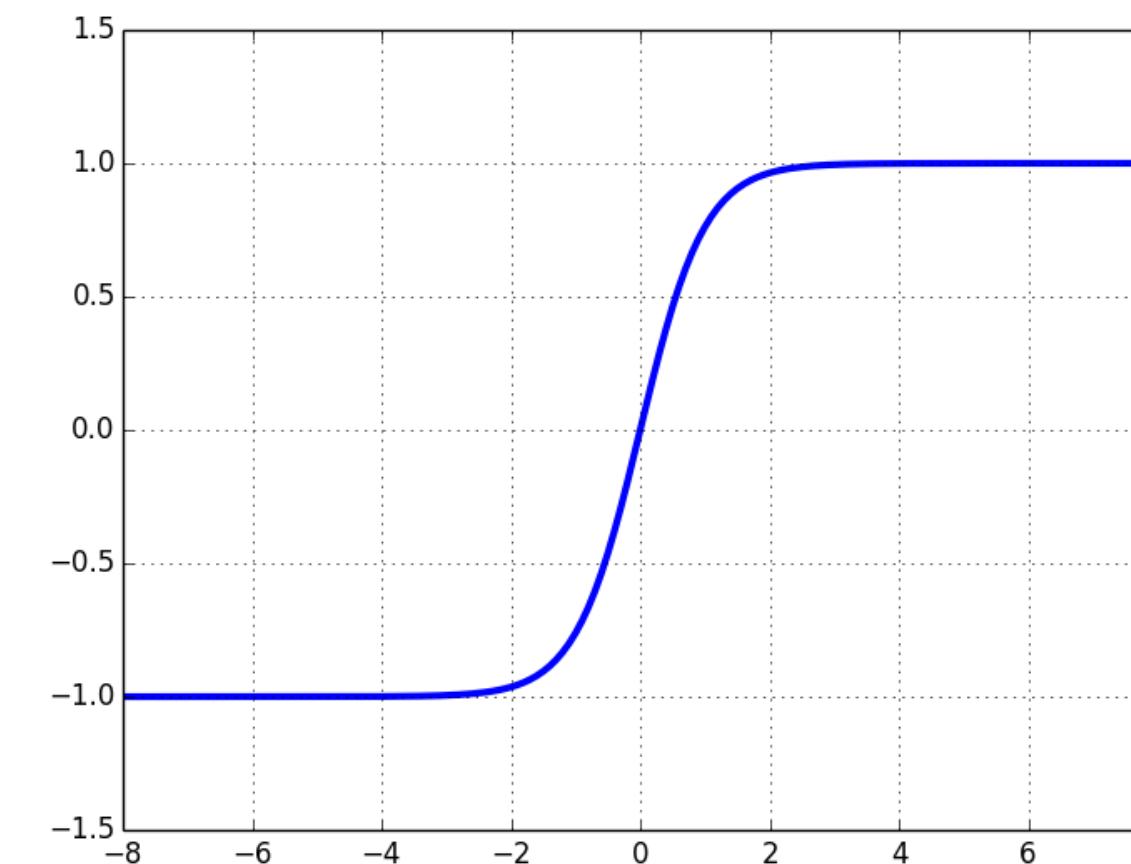
階段関数



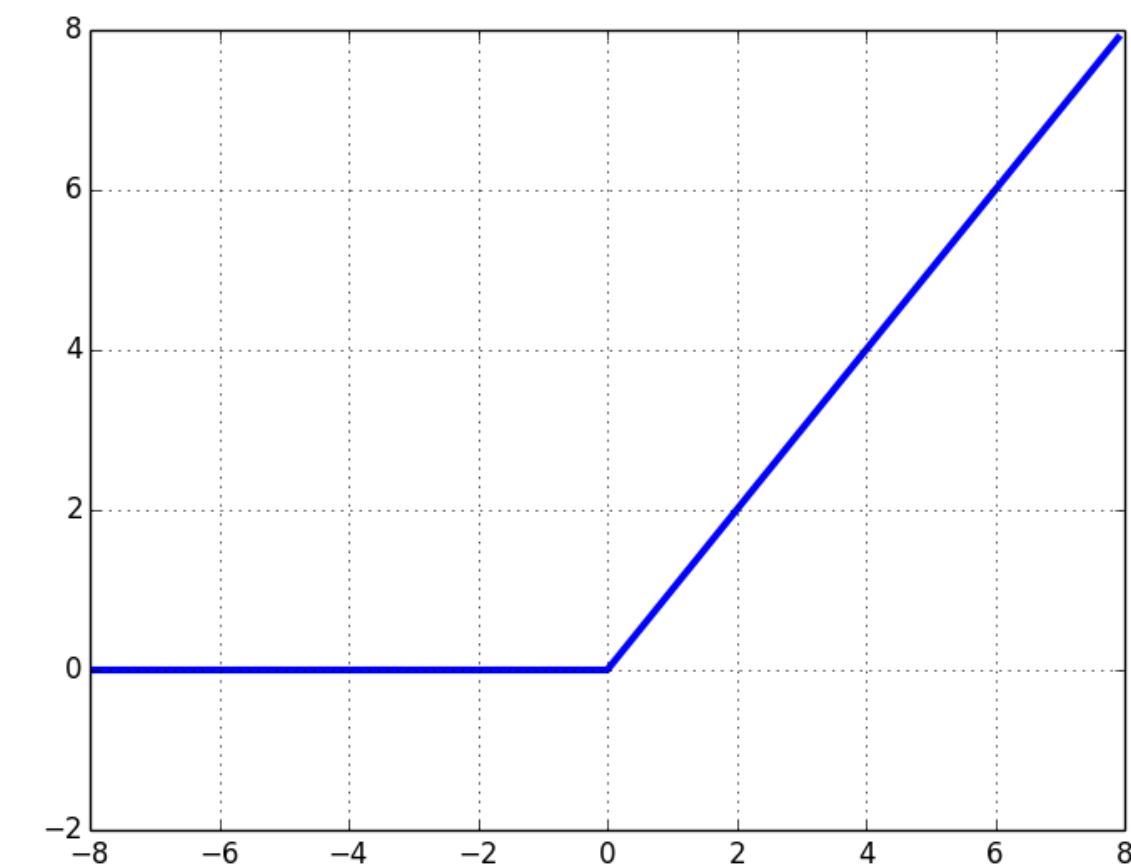
シグモイド関数

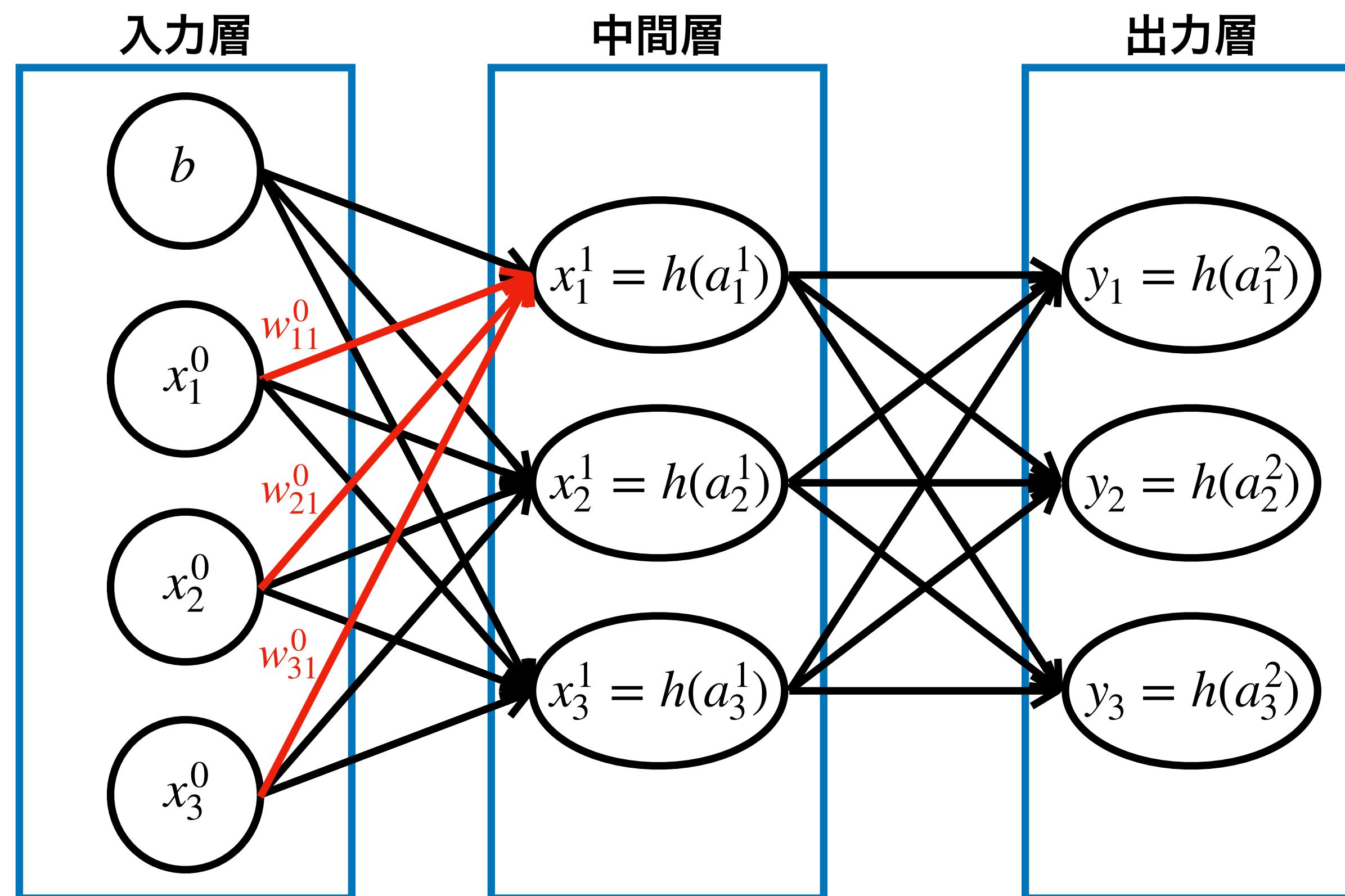


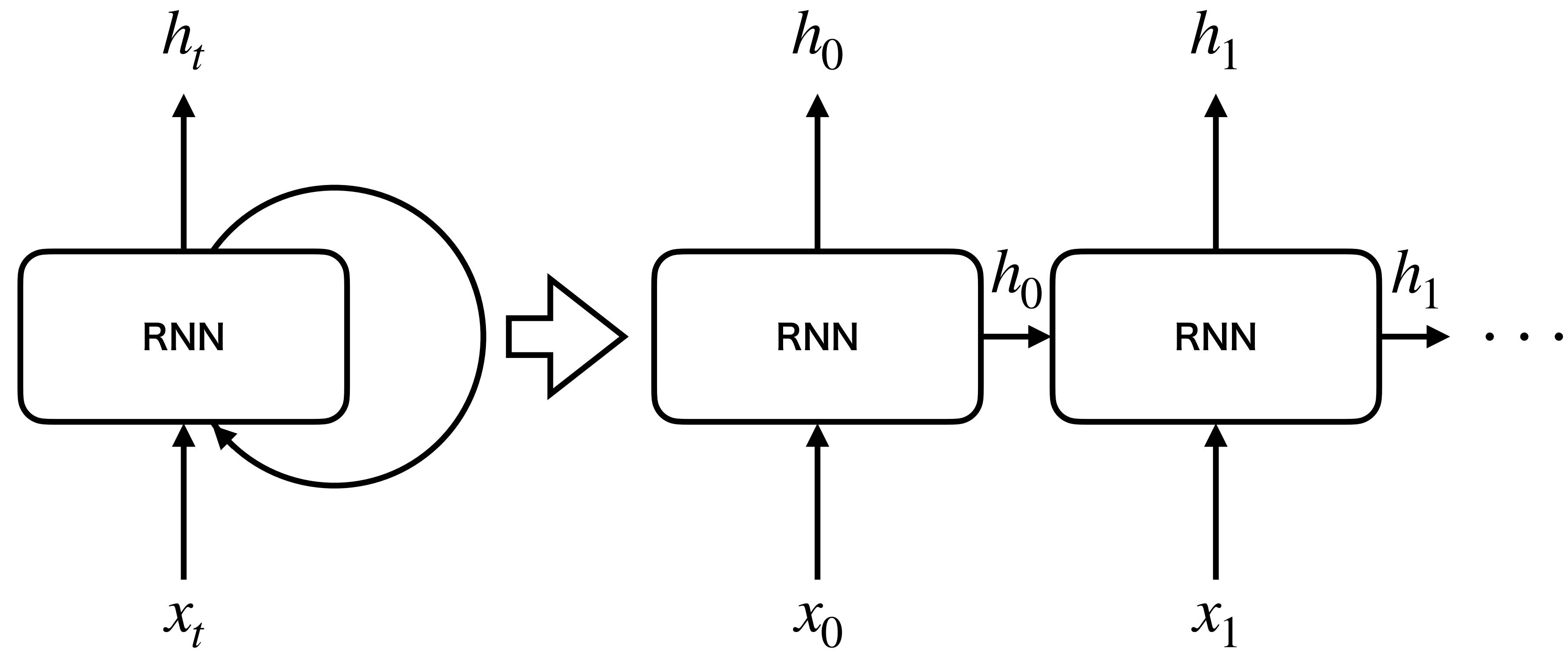
tanh関数

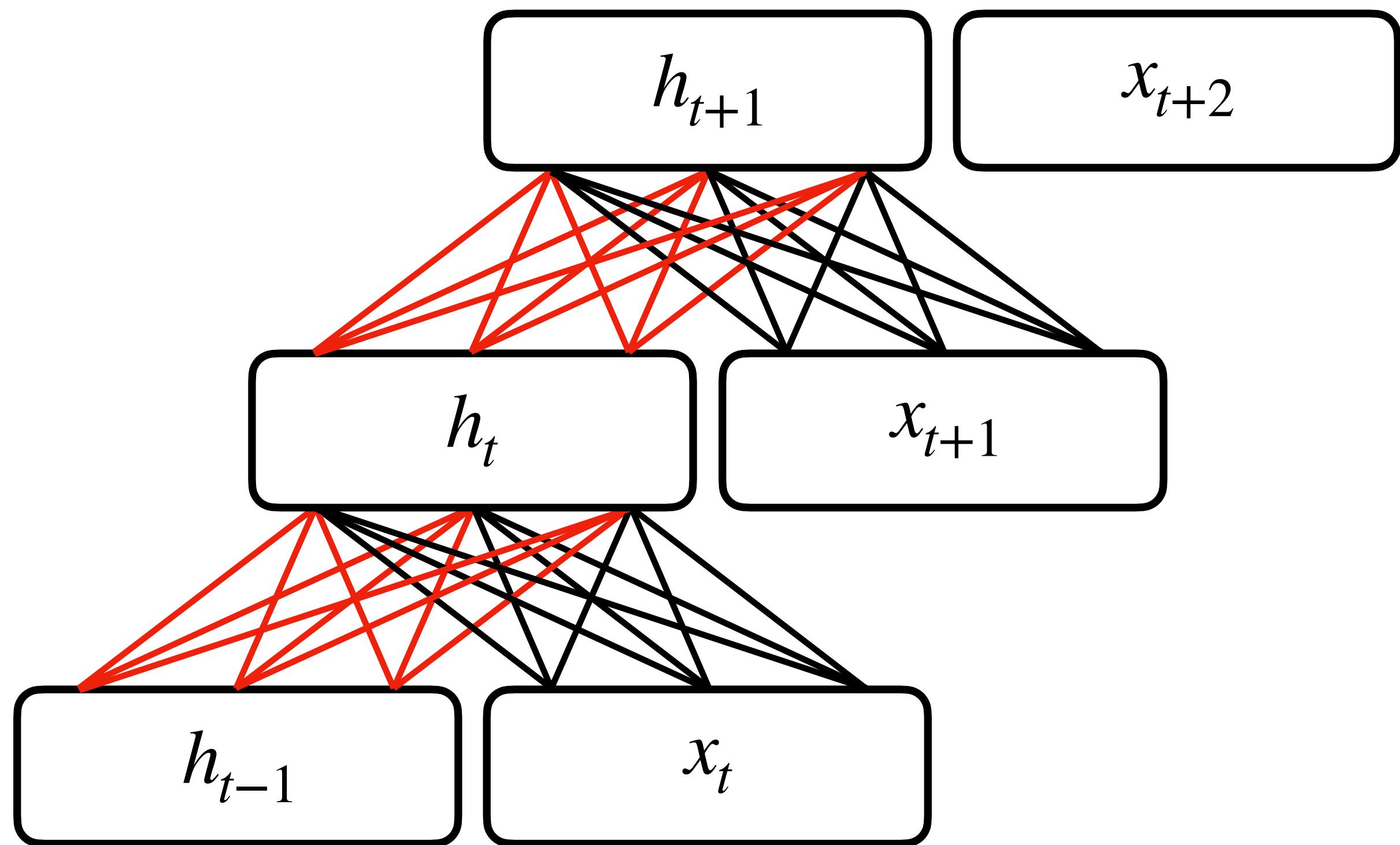


ReLU関数

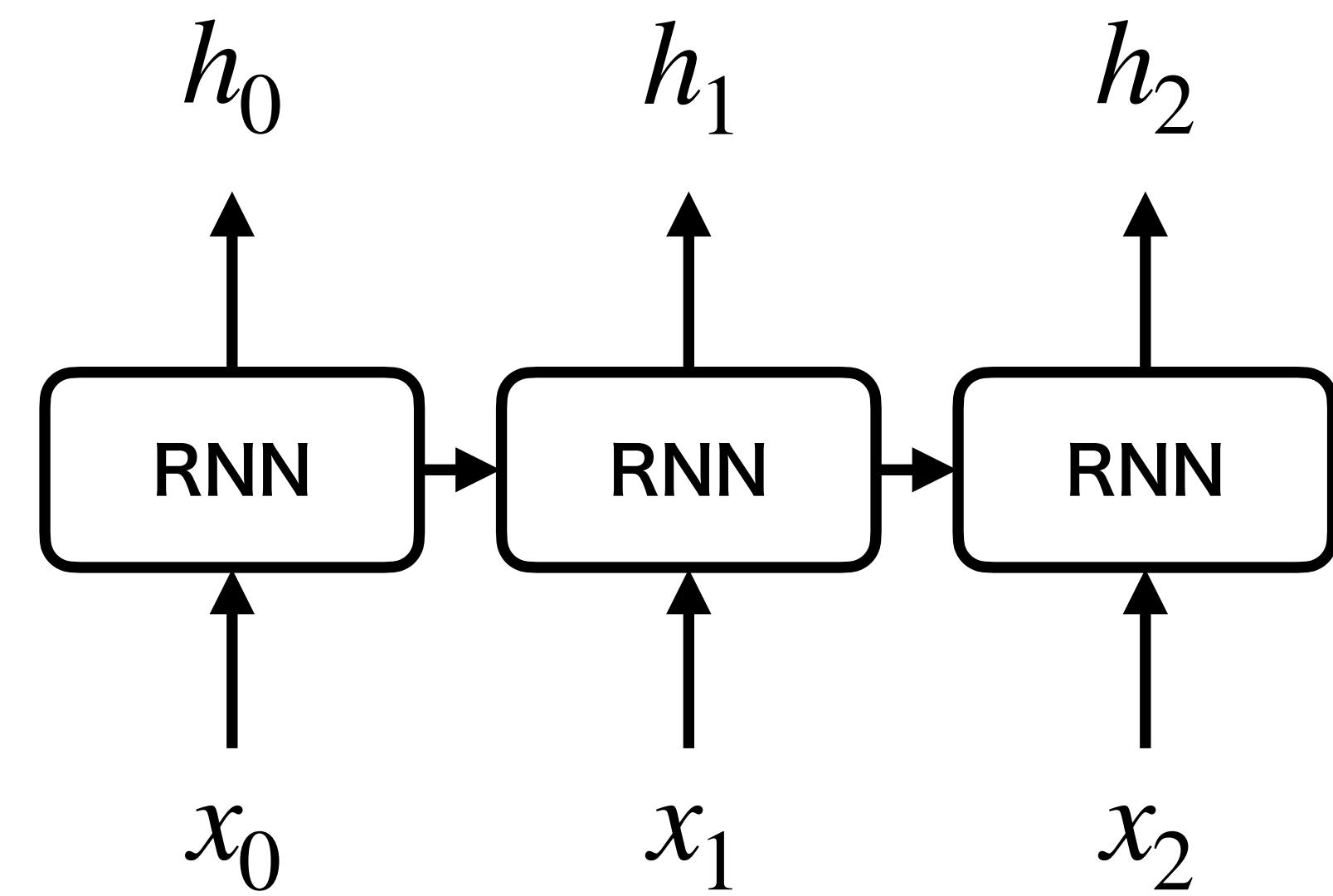




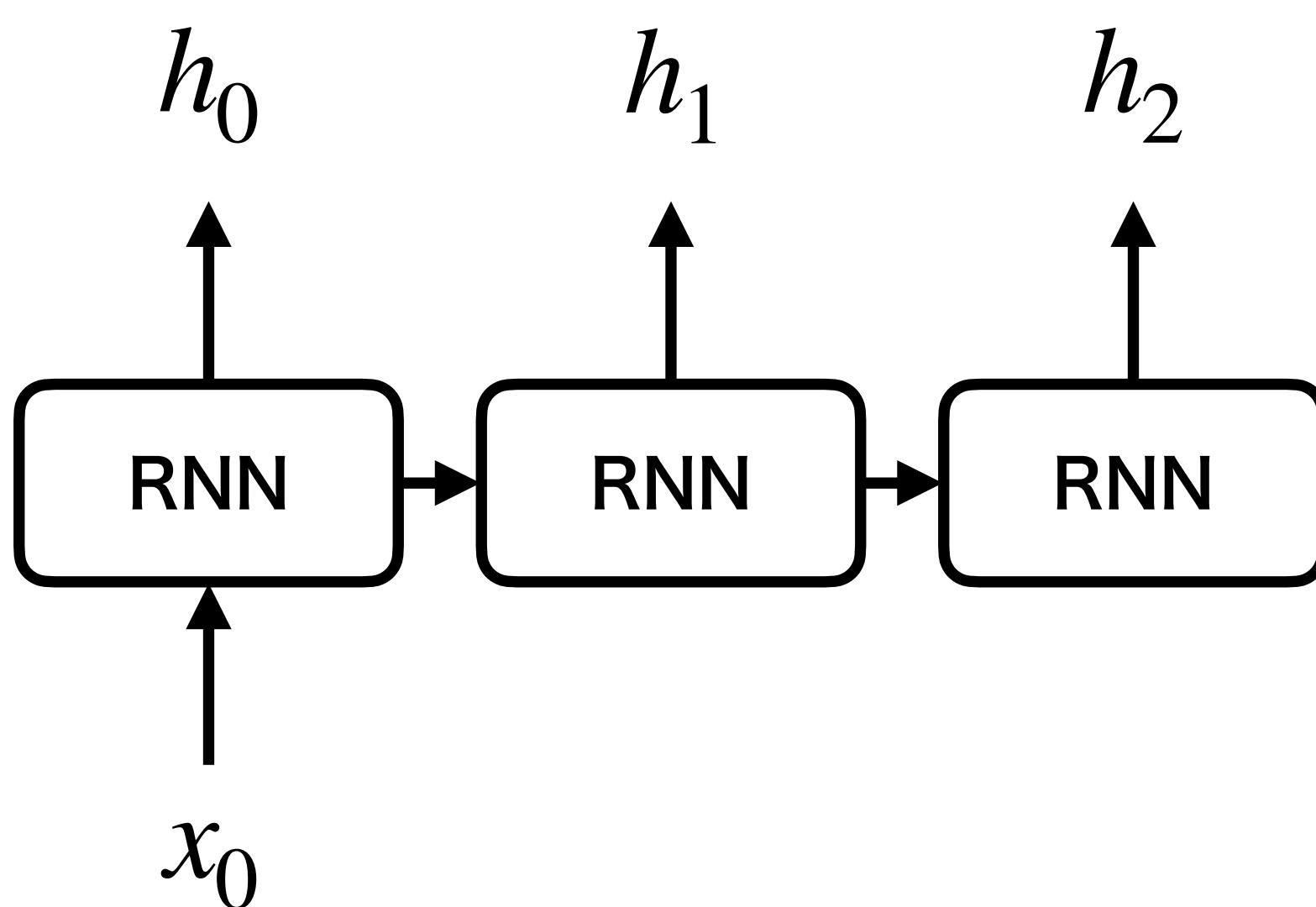




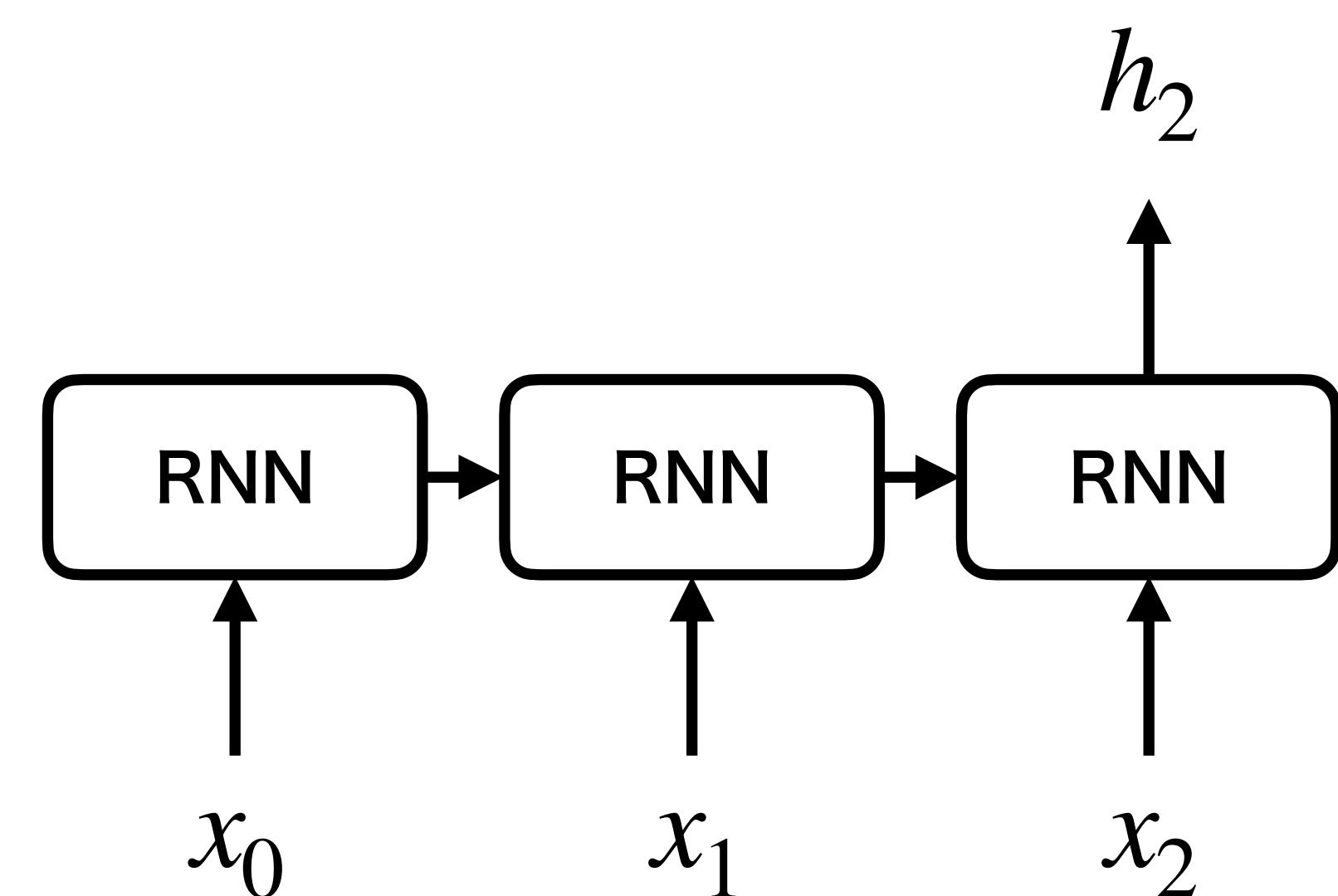
Many to Many

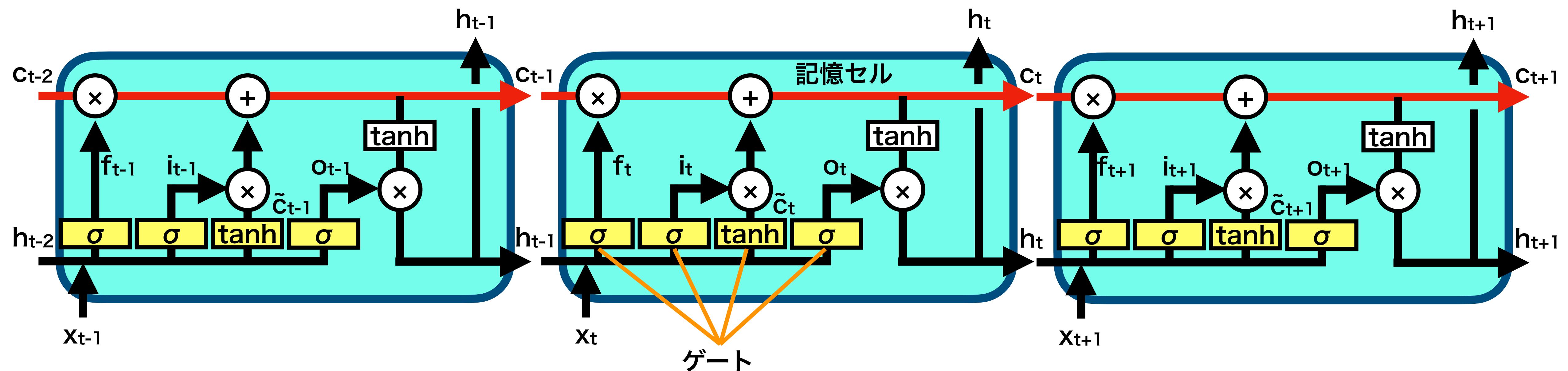


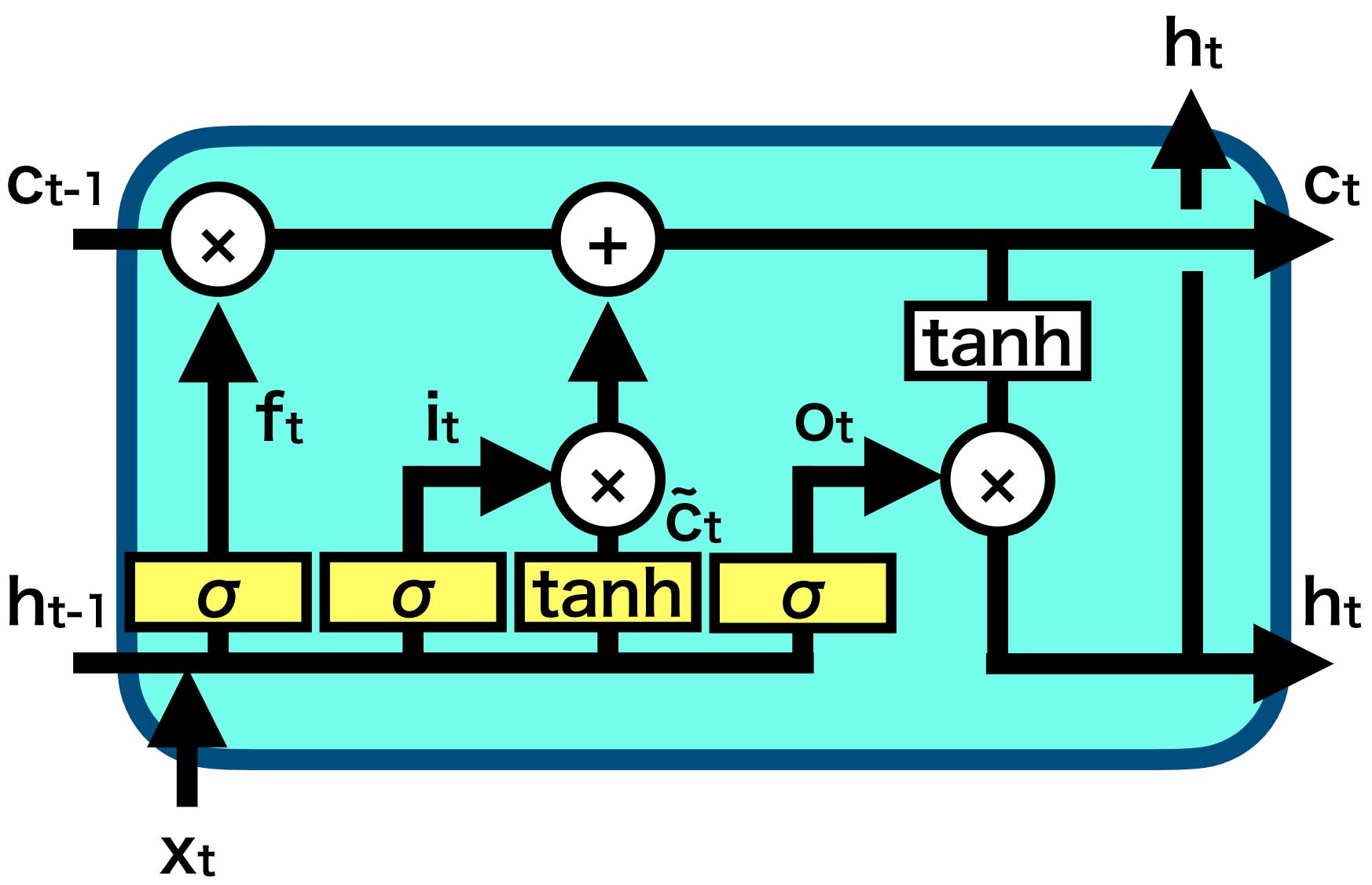
One to Many

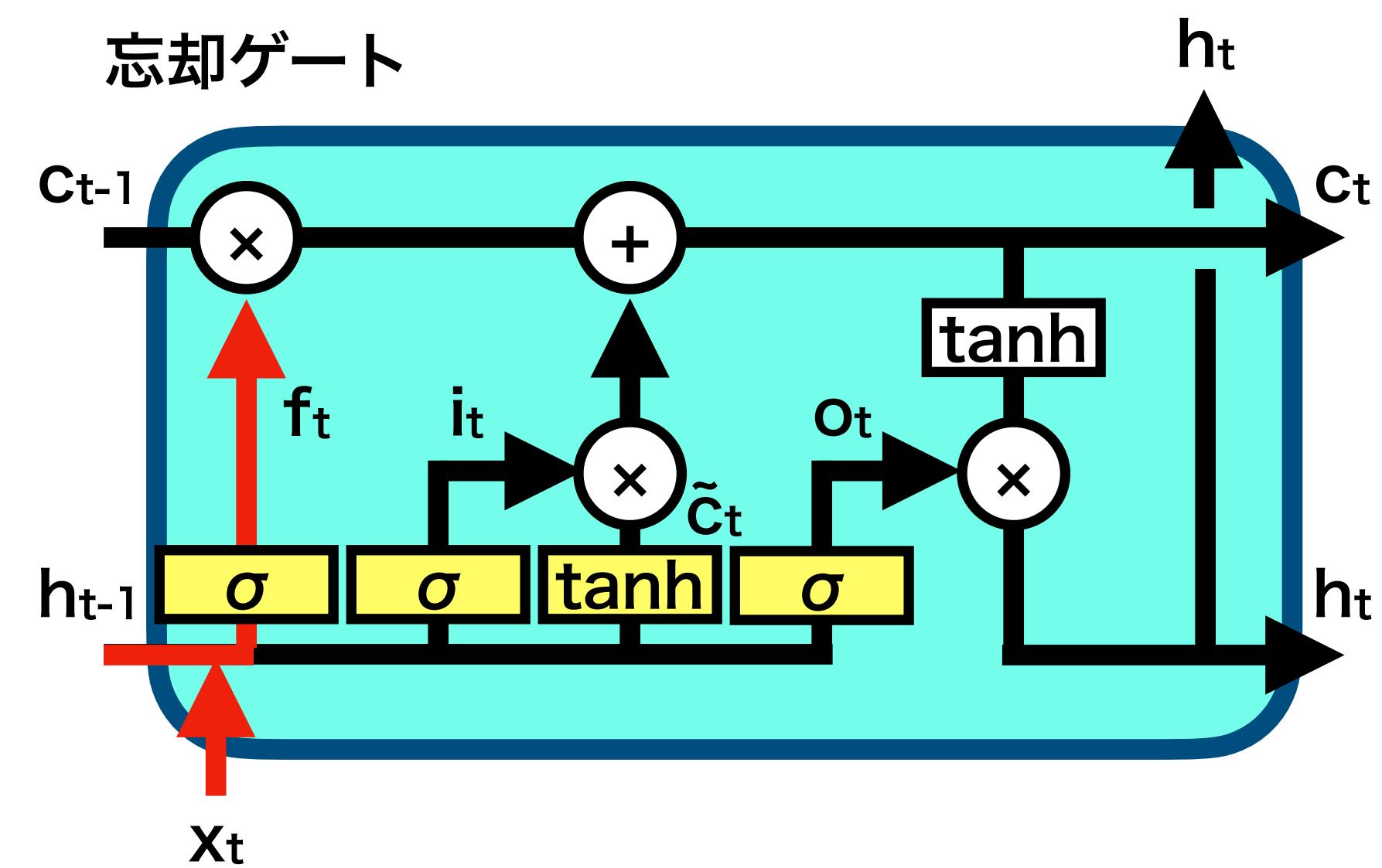


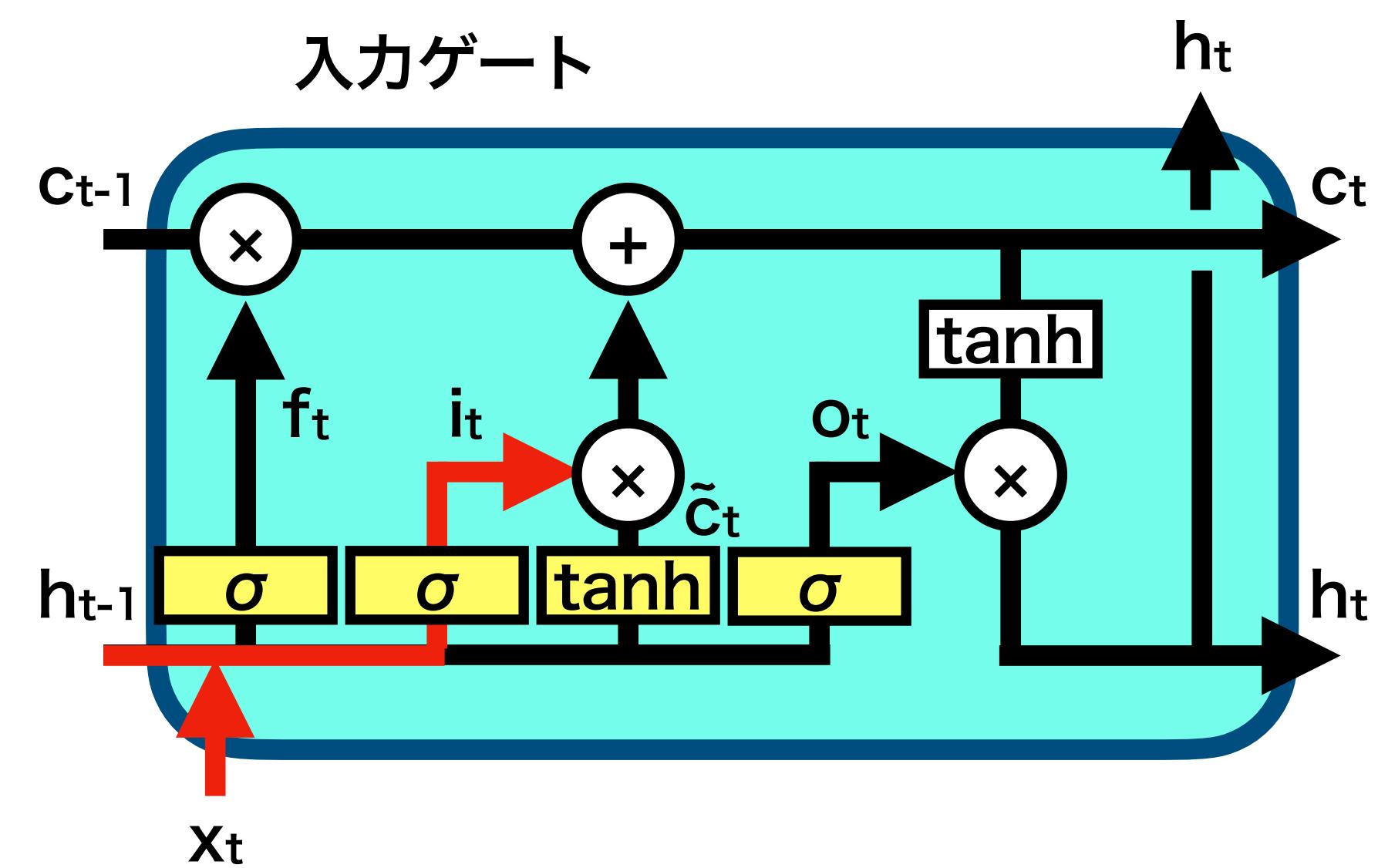
Many to One

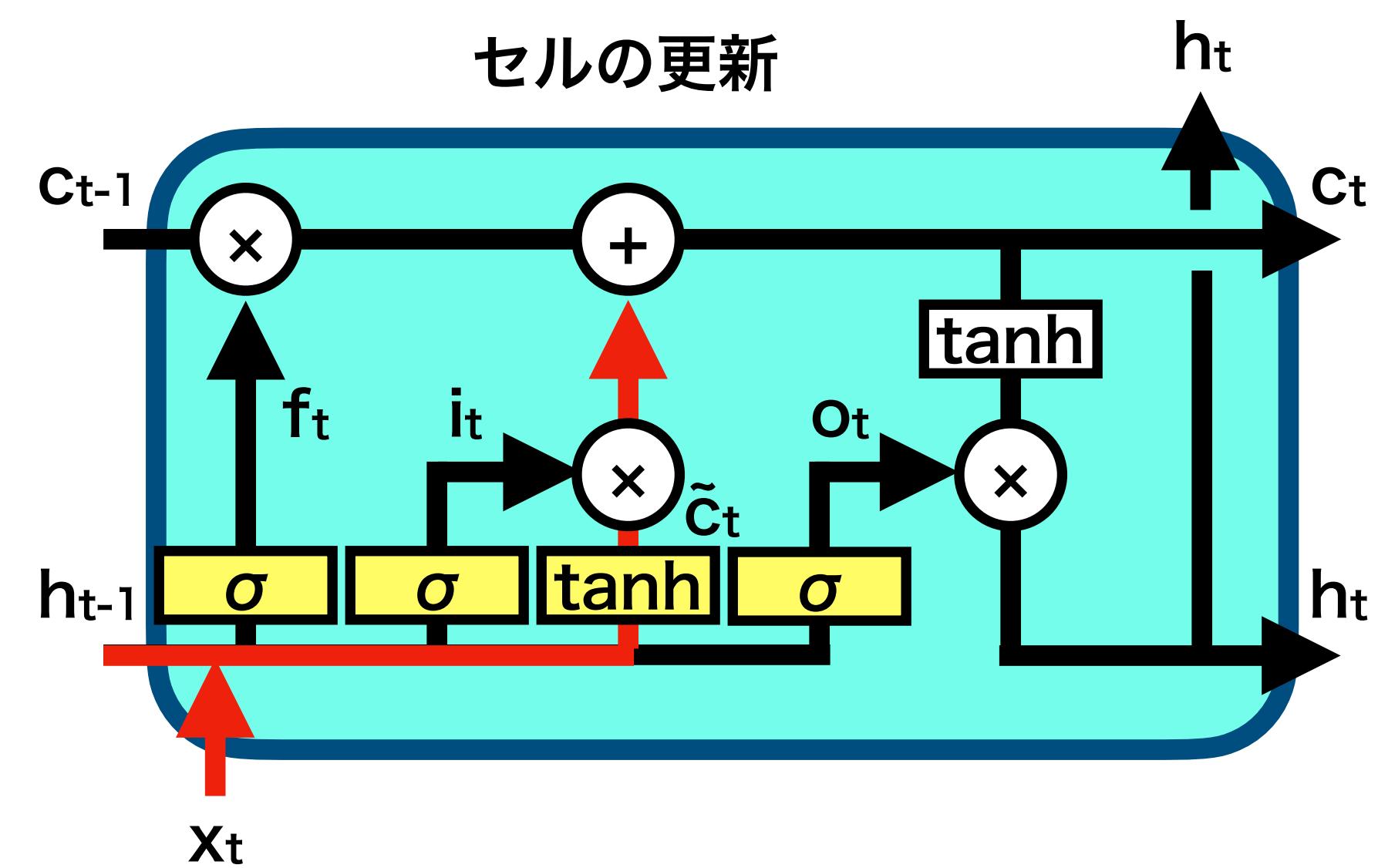


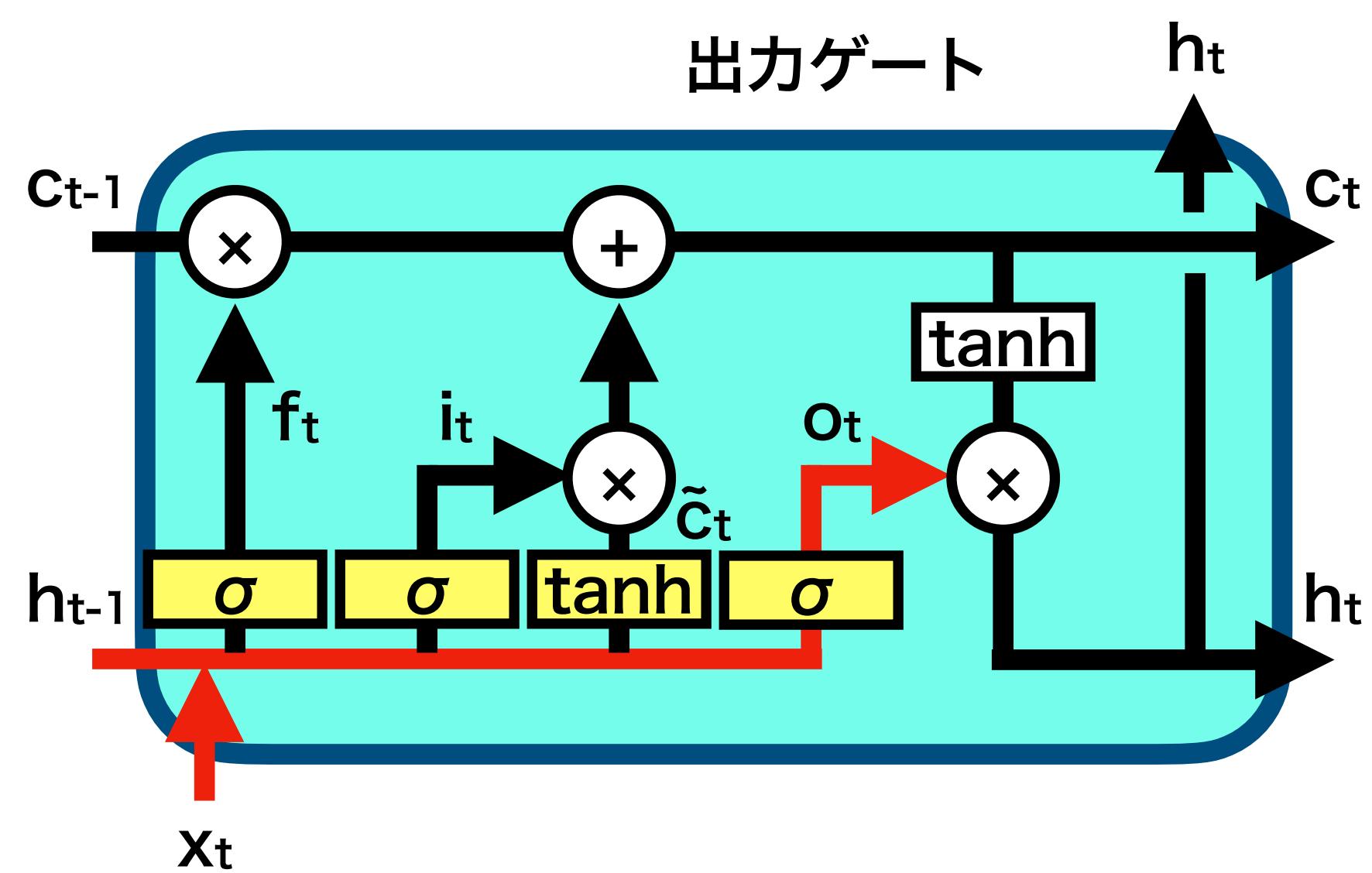


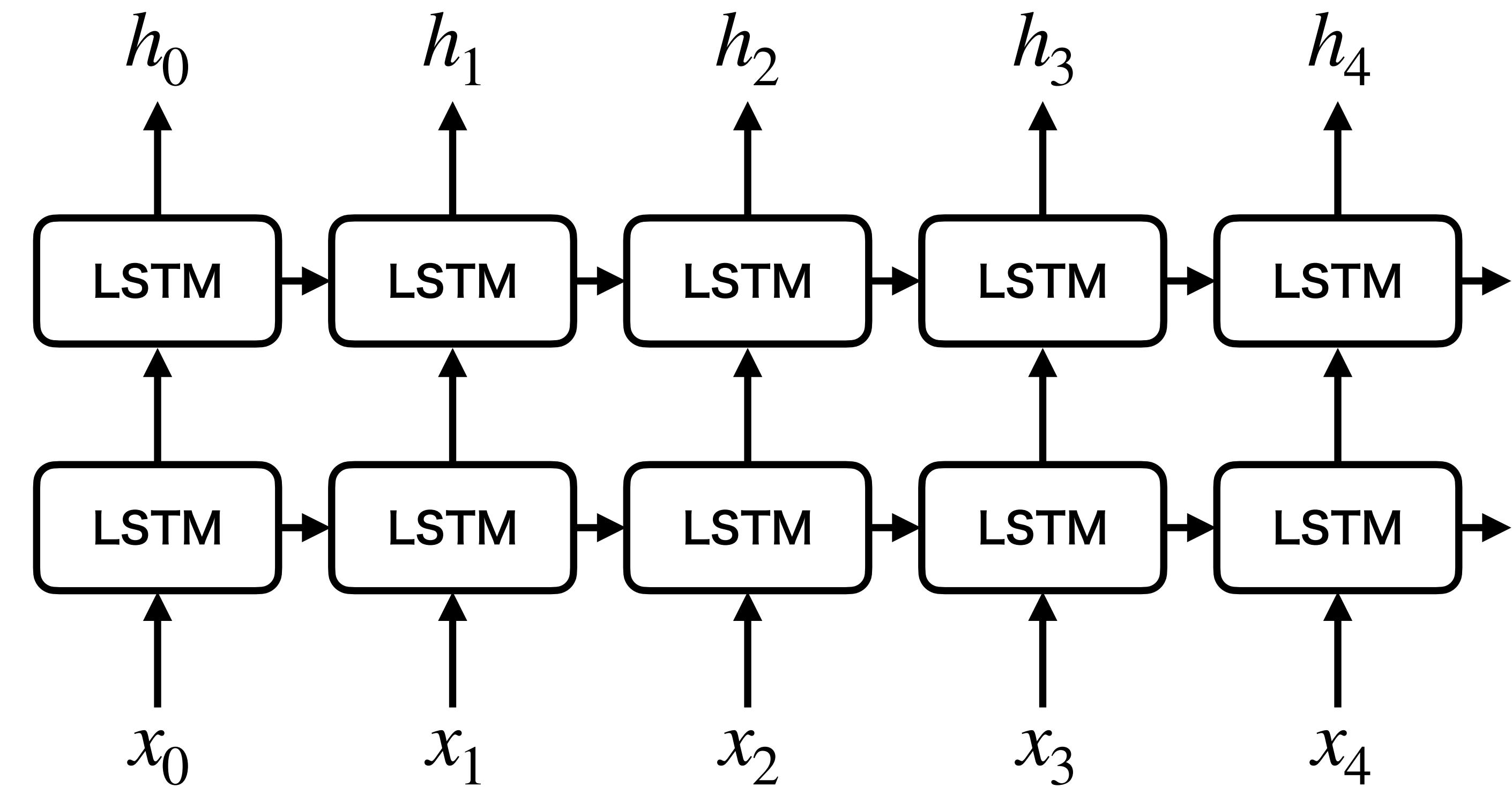


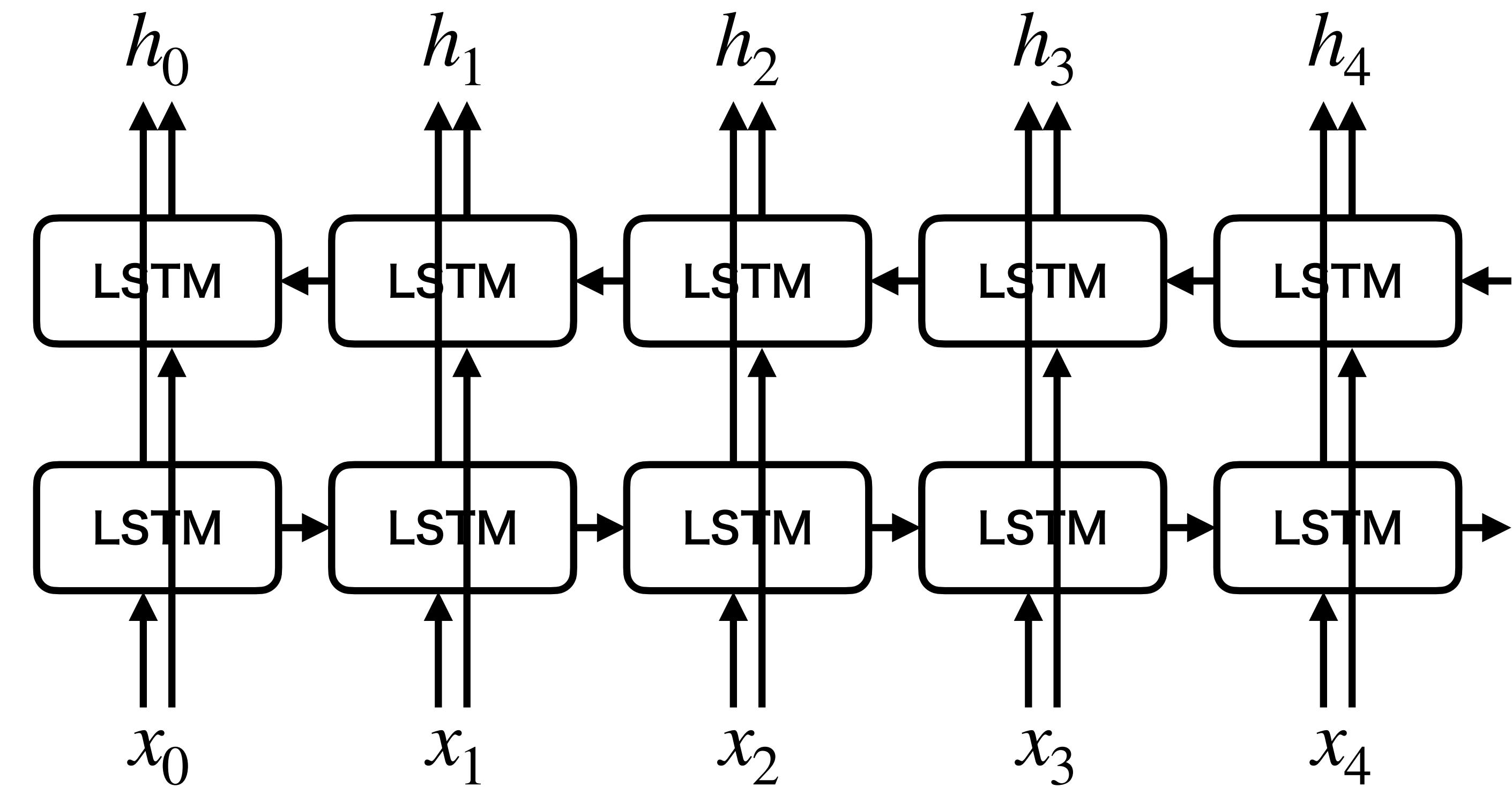


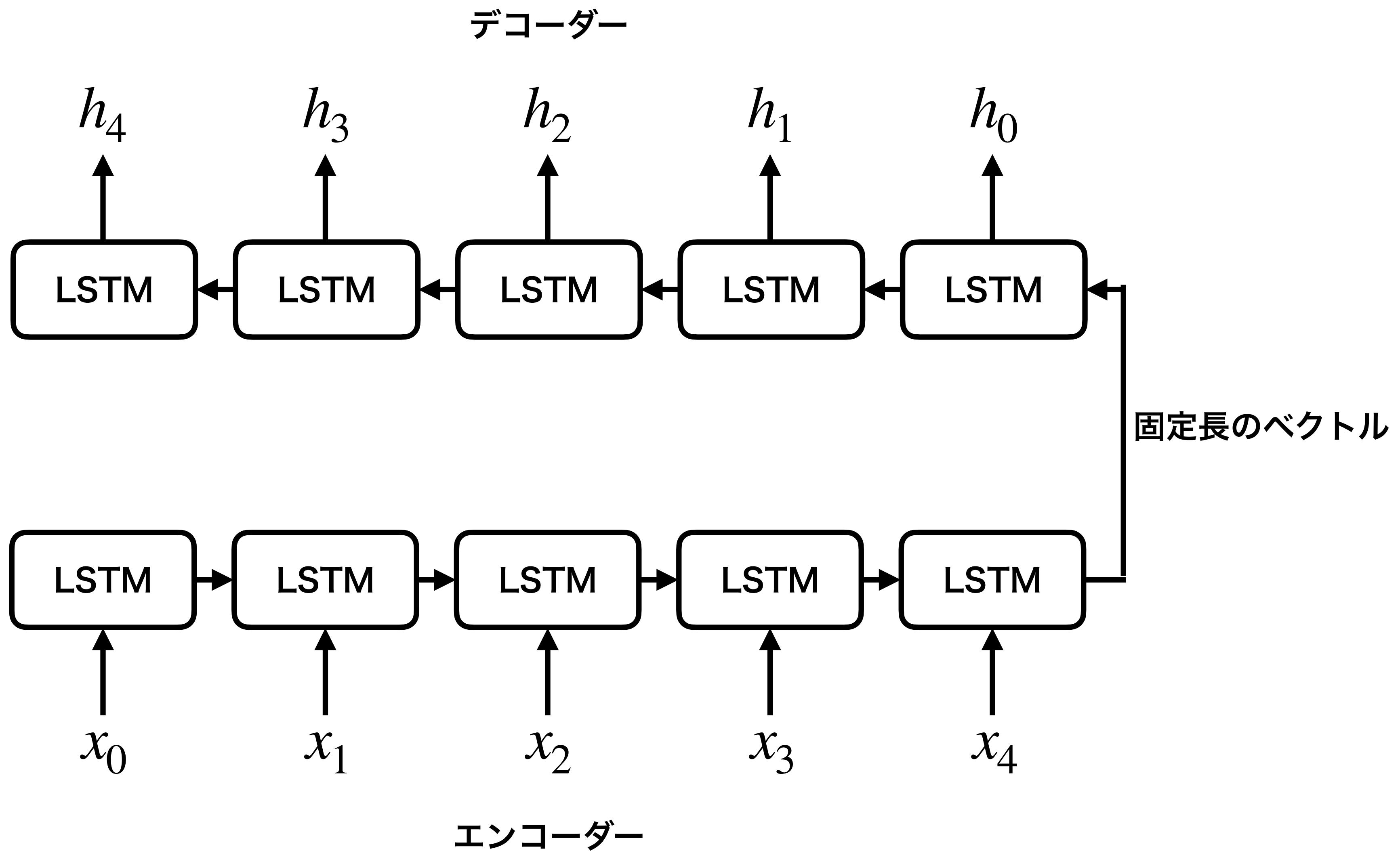


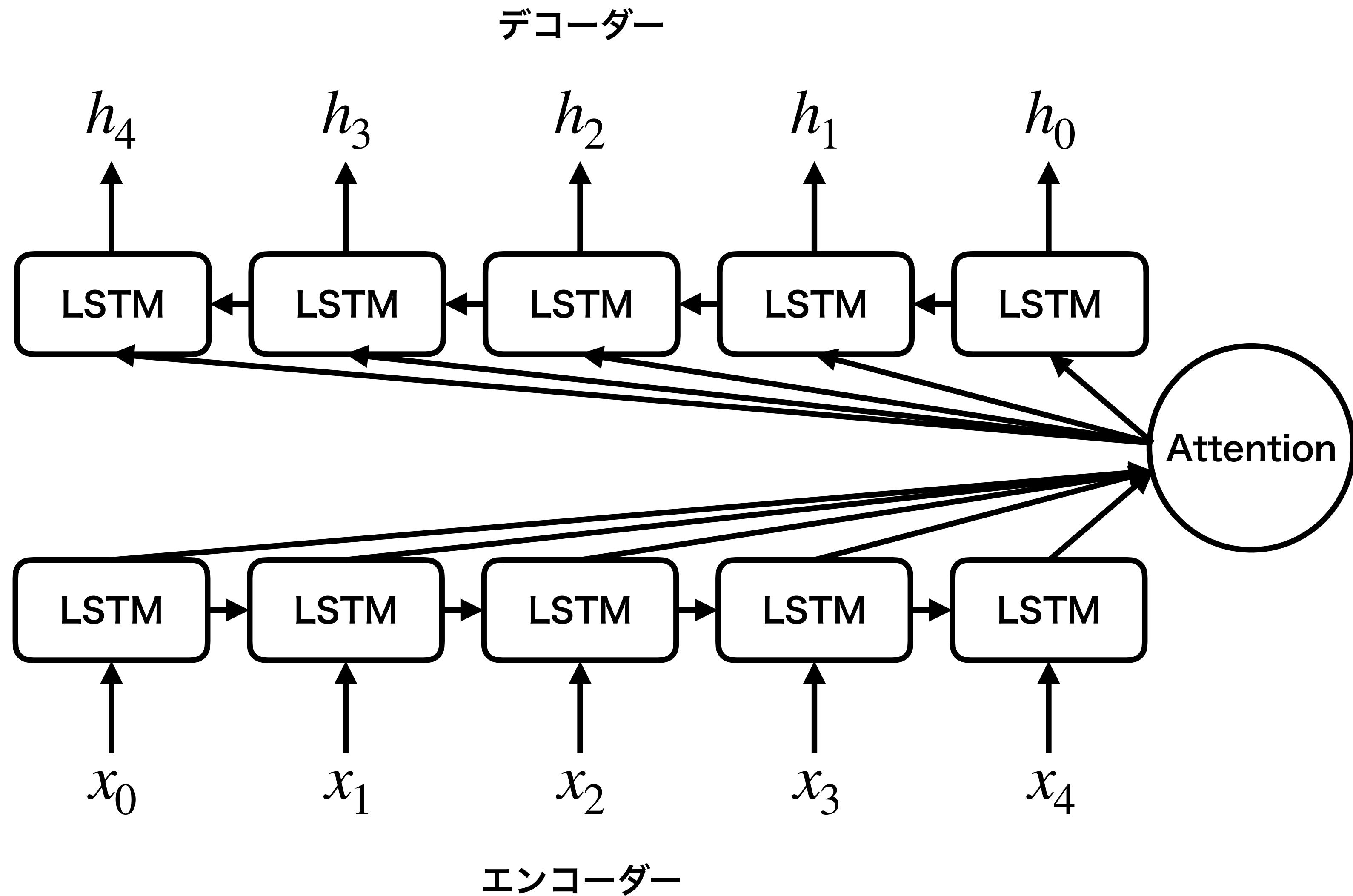


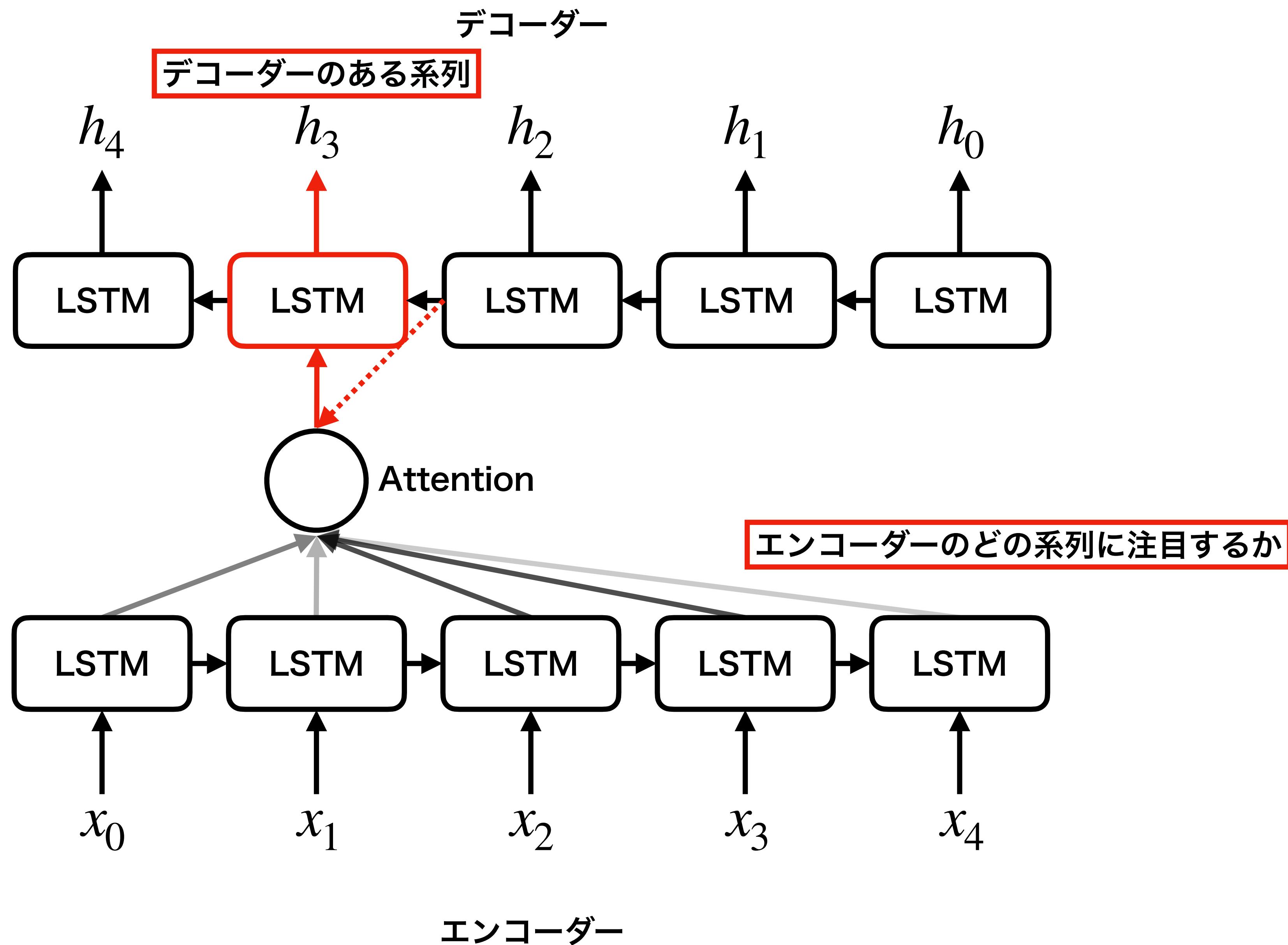




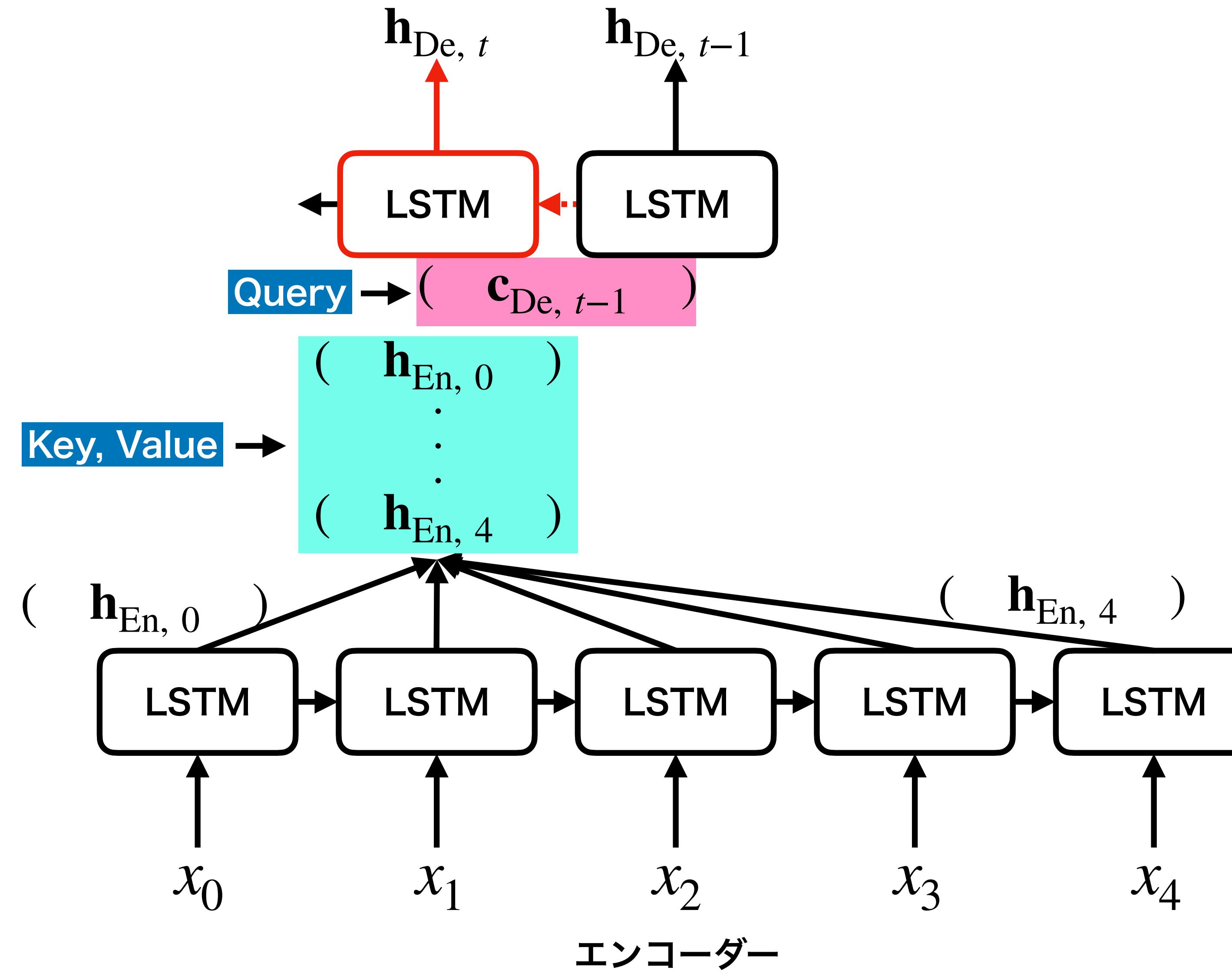




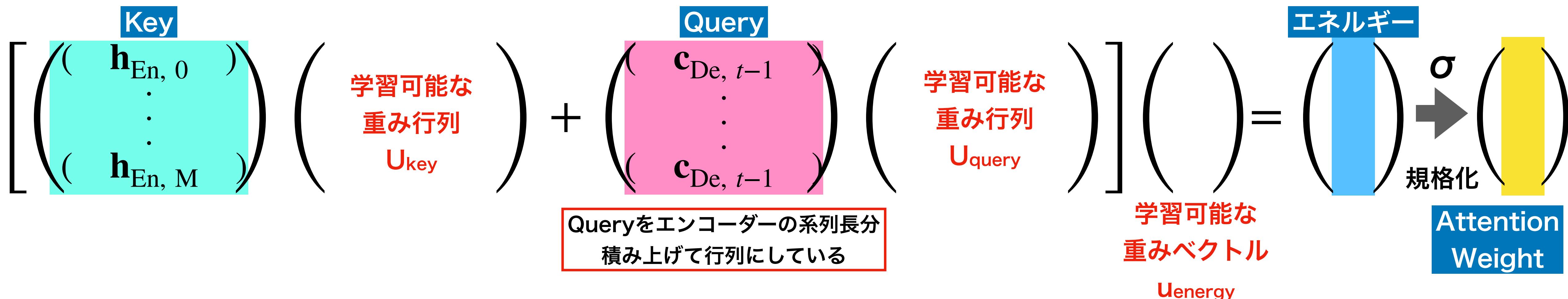




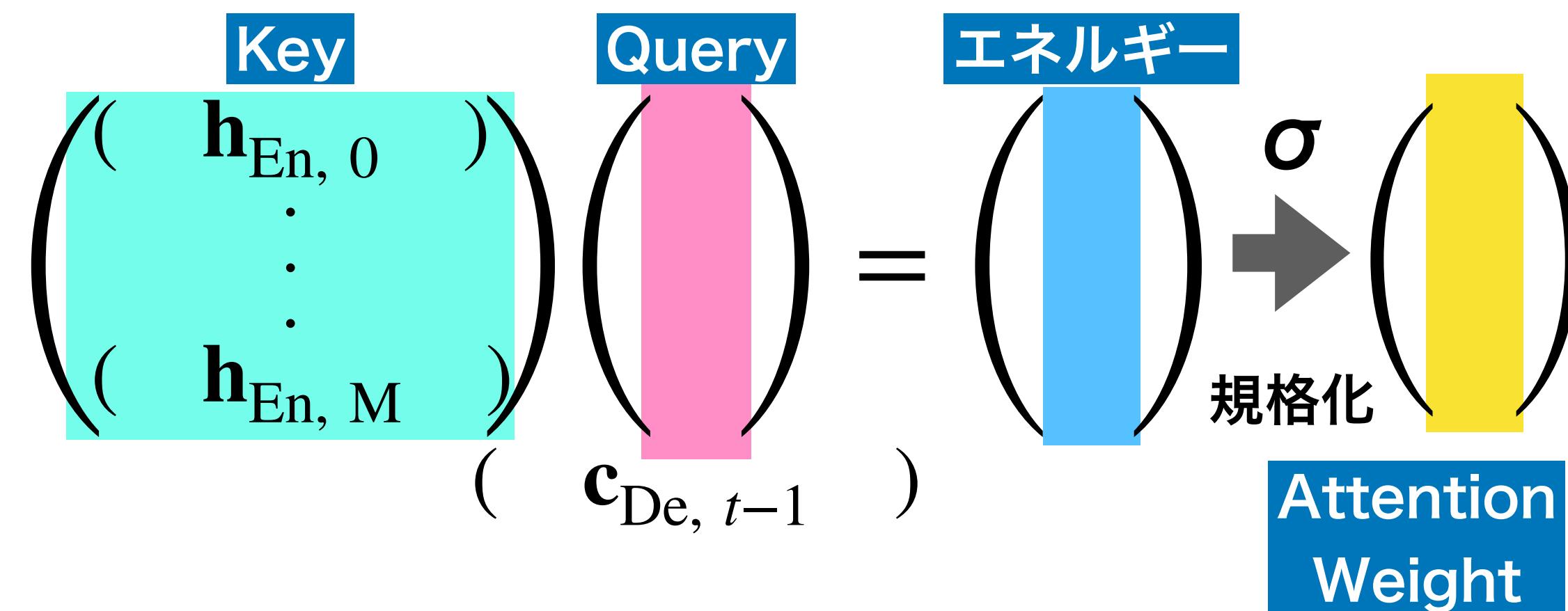
デコーダー



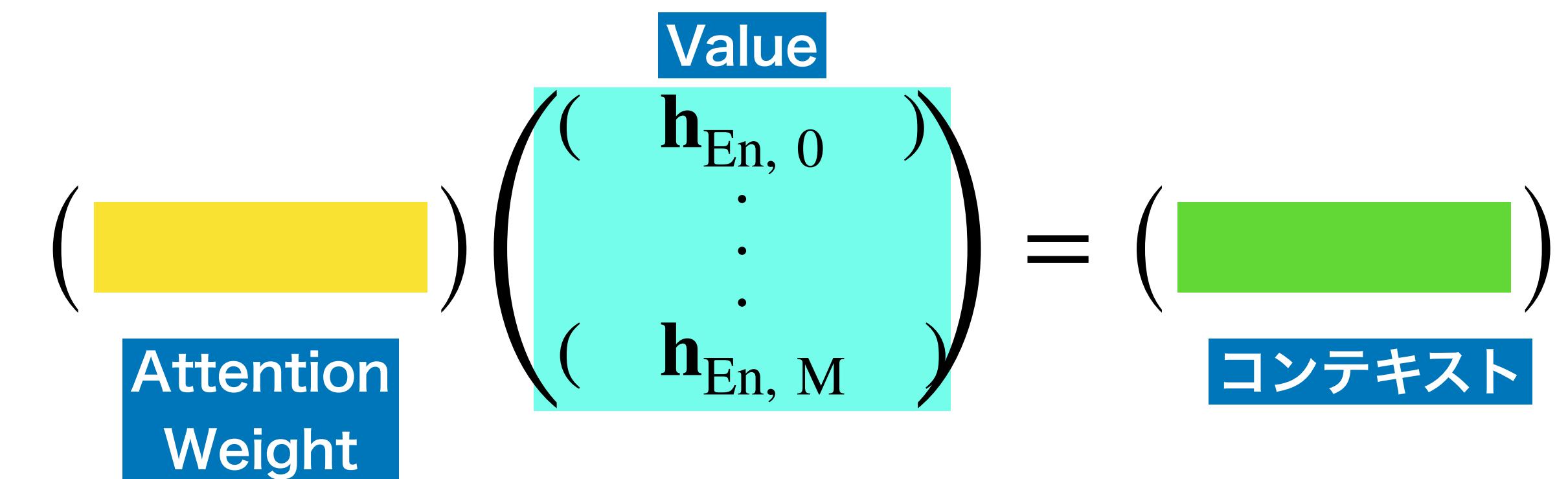
Additive Attention



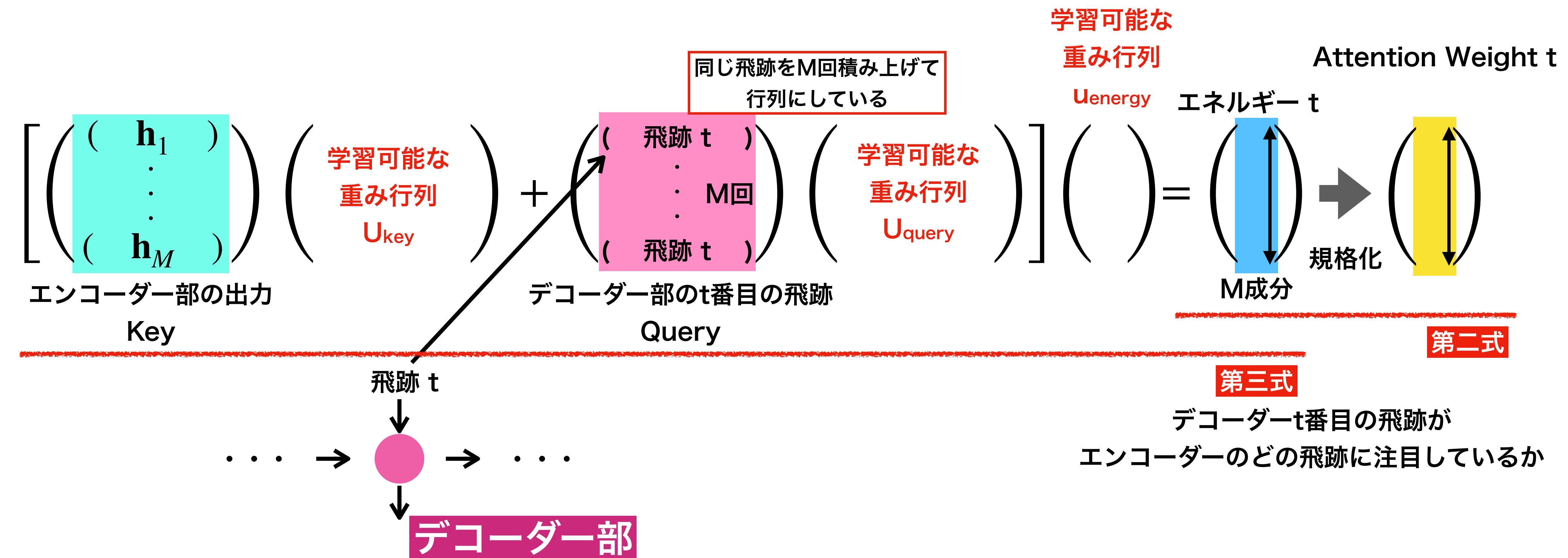
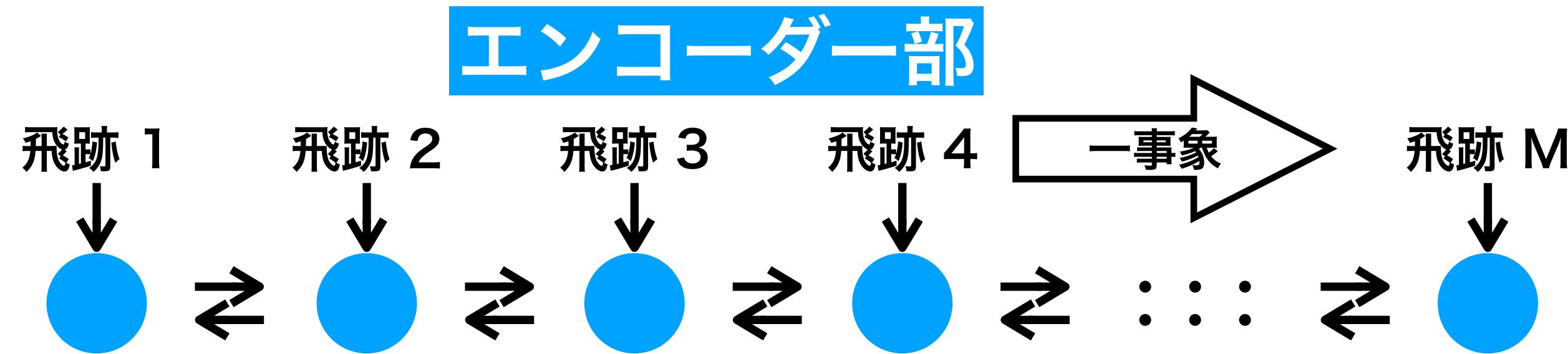
Dot-Product Attention

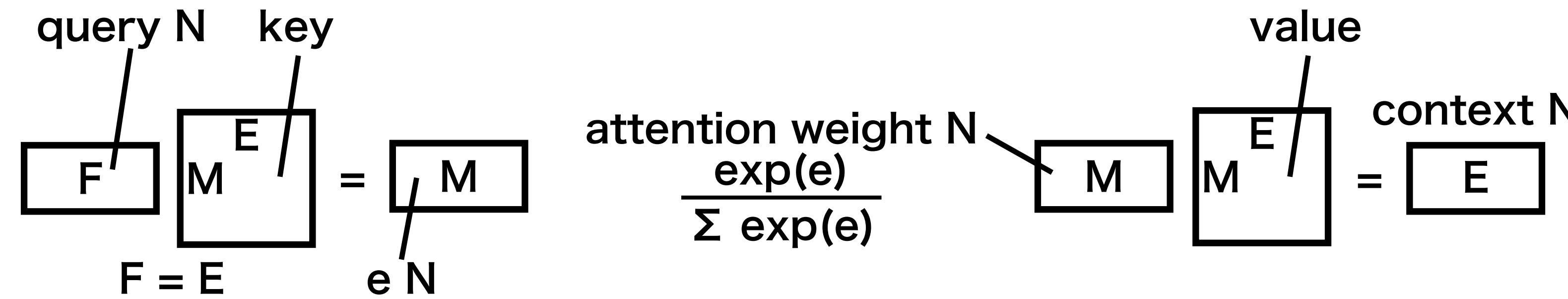
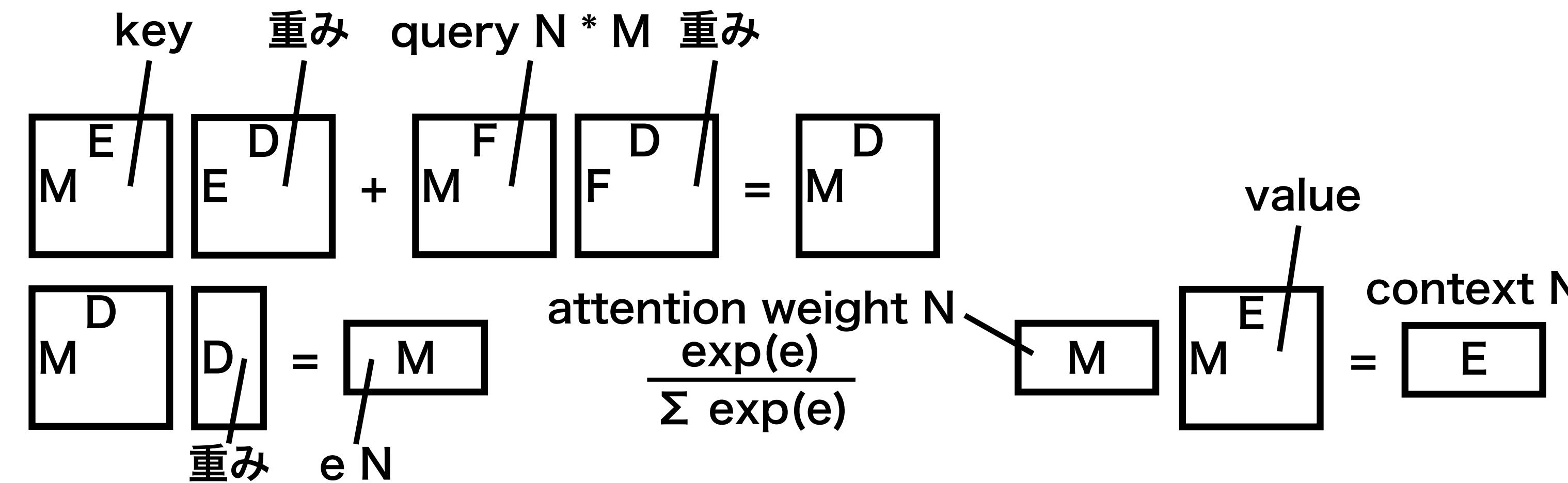


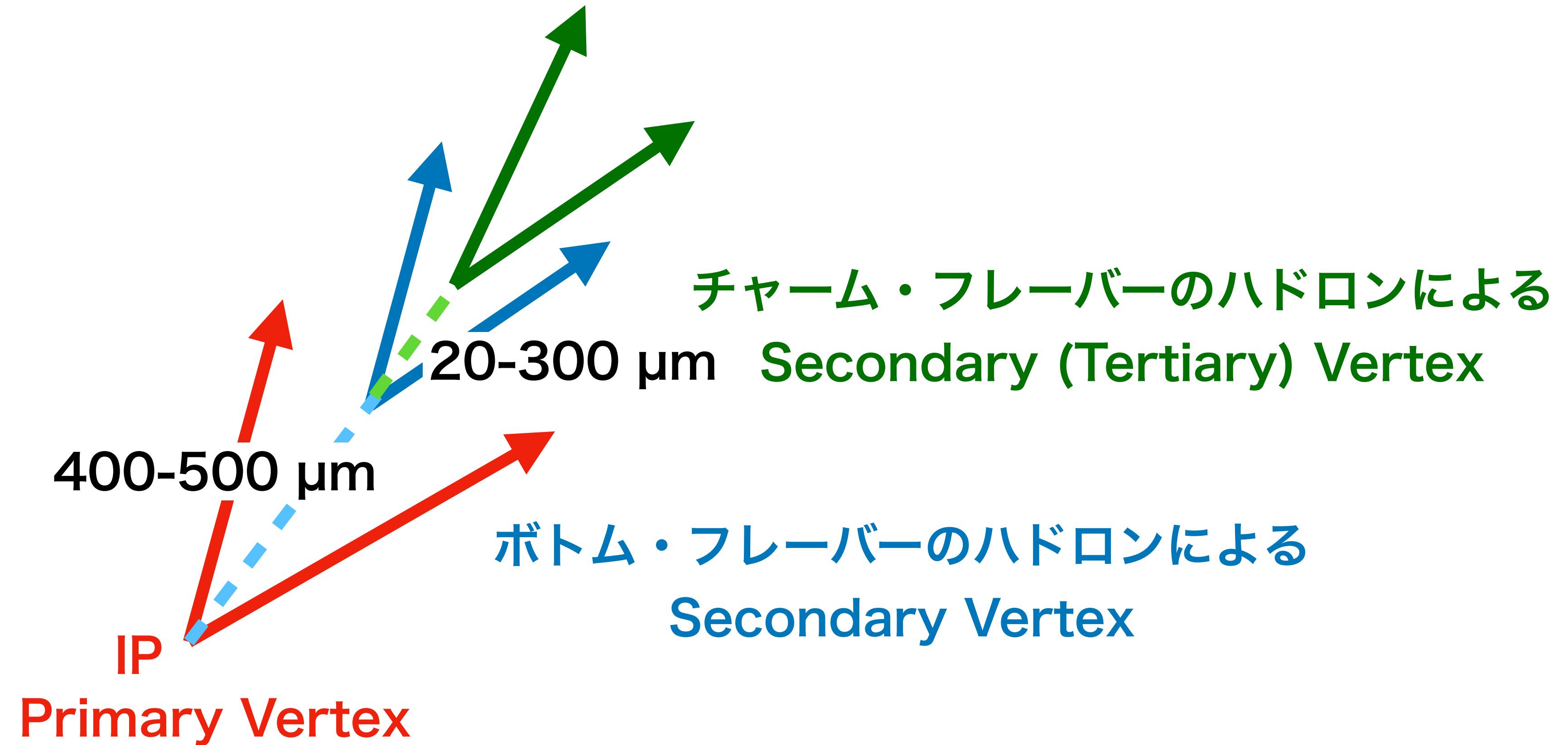
コンテキストの計算



$$\text{Attention Weight } t \begin{pmatrix} \text{Yellow Bar} \\ \vdots \\ \text{Yellow Bar} \end{pmatrix} \begin{pmatrix} (\mathbf{h}_1) \\ \vdots \\ (\mathbf{h}_M) \end{pmatrix} = \text{Context } t \begin{pmatrix} \text{Green Bar} \end{pmatrix}$$







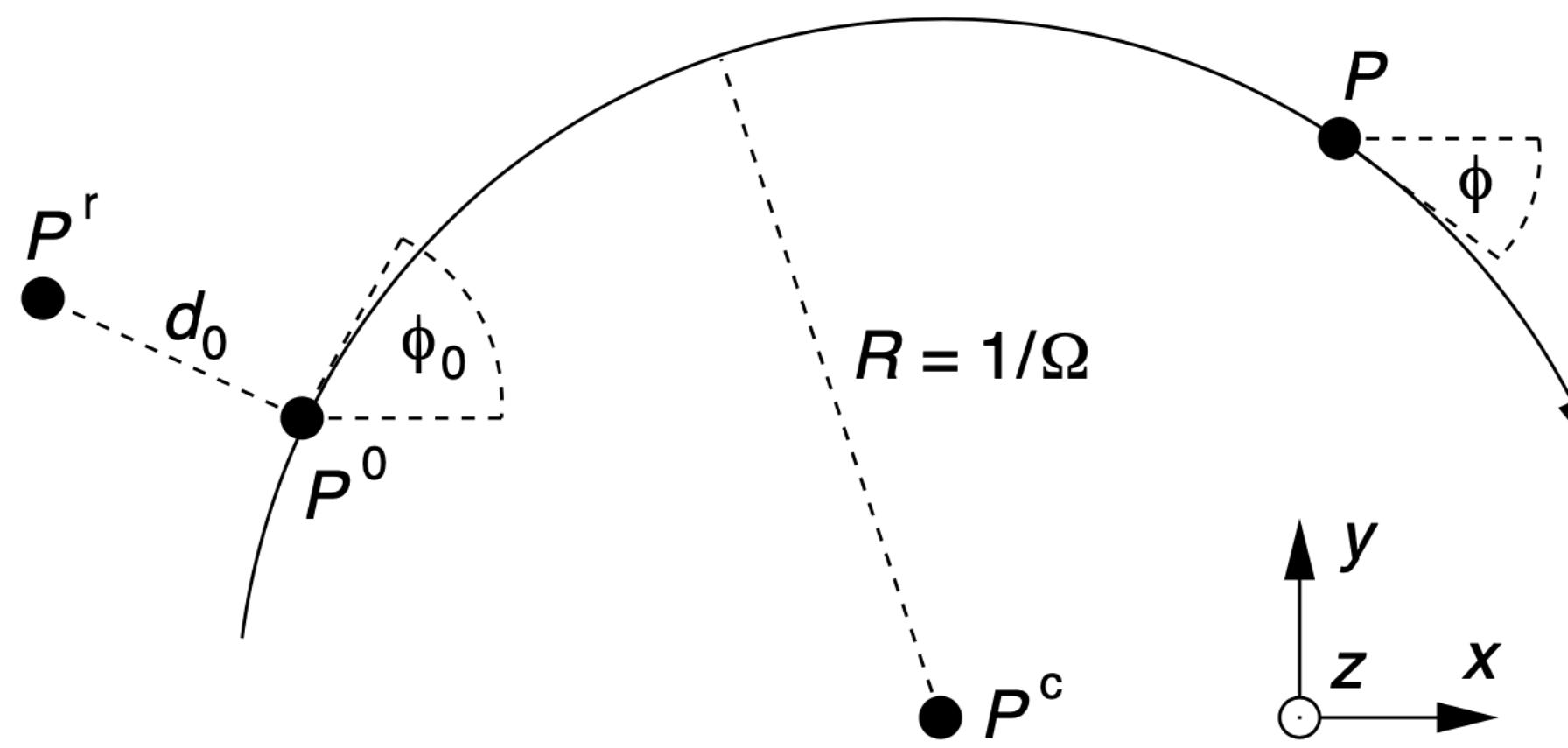


Figure 1: The projection of a helix segment in the xy plane is a part of an arc with centre \mathbf{P}^c and radius R . The direction of the particle is shown with the arrow at the arc. All track parameters are given relative to the reference point \mathbf{P}^r .

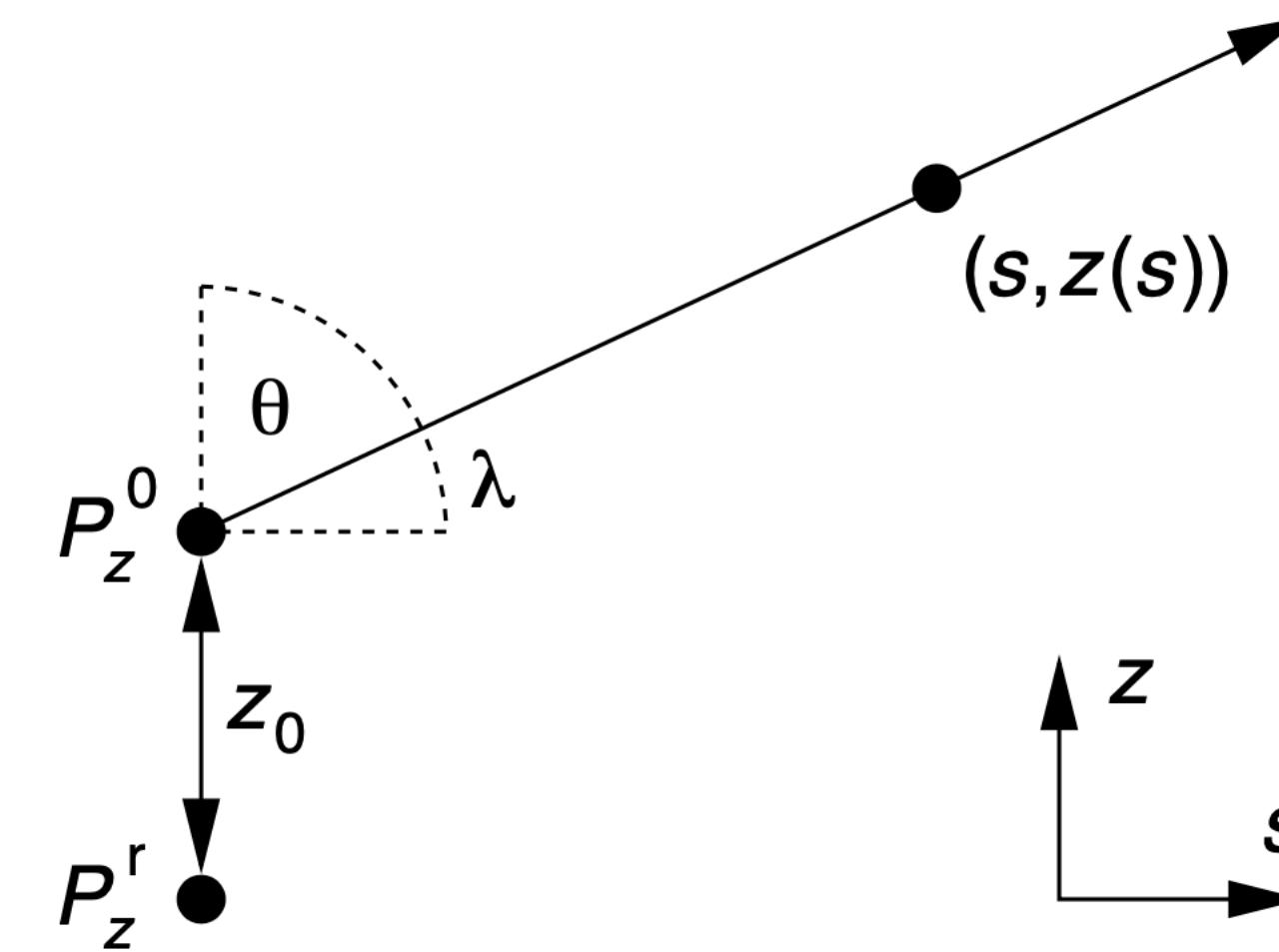
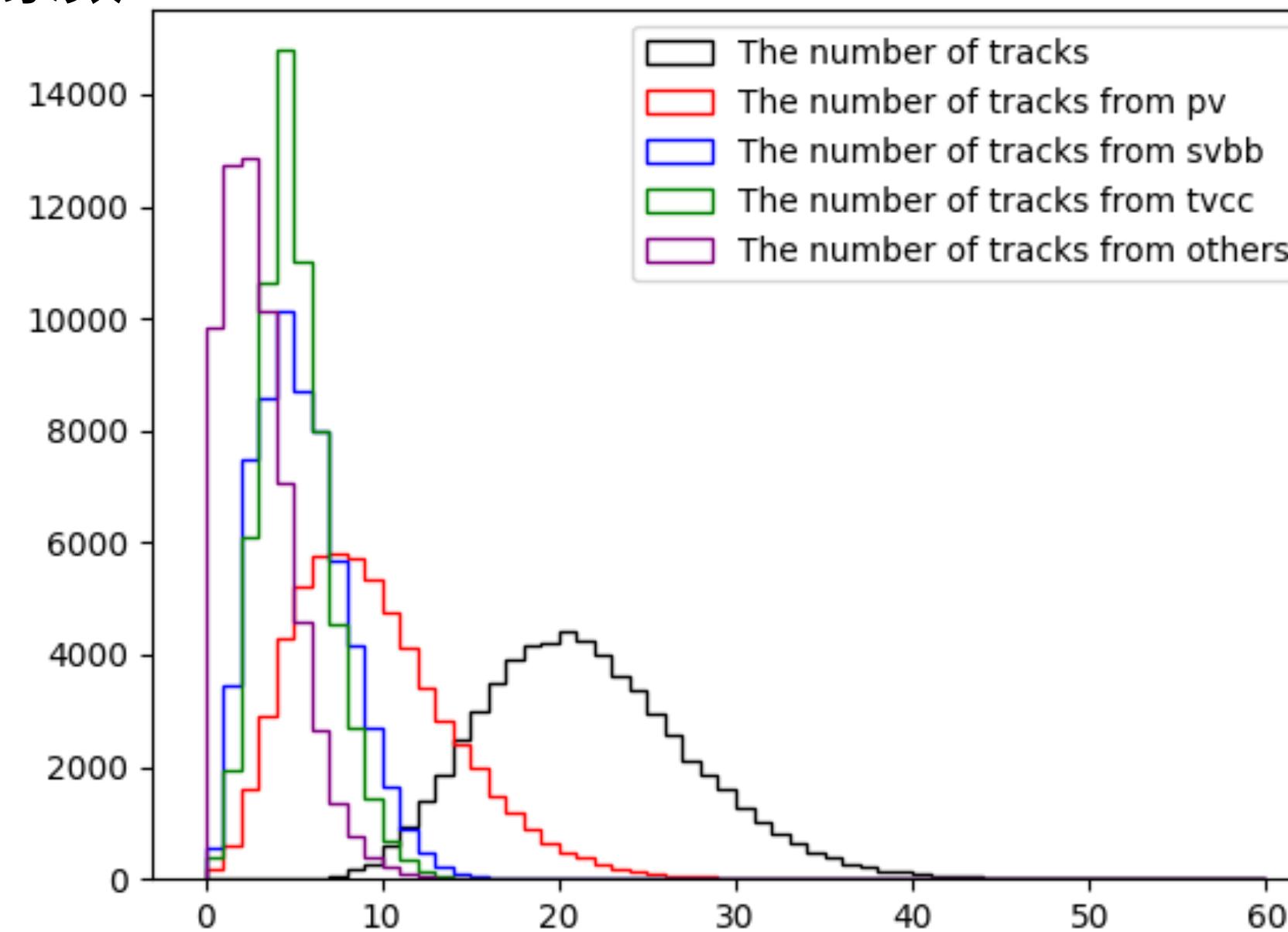
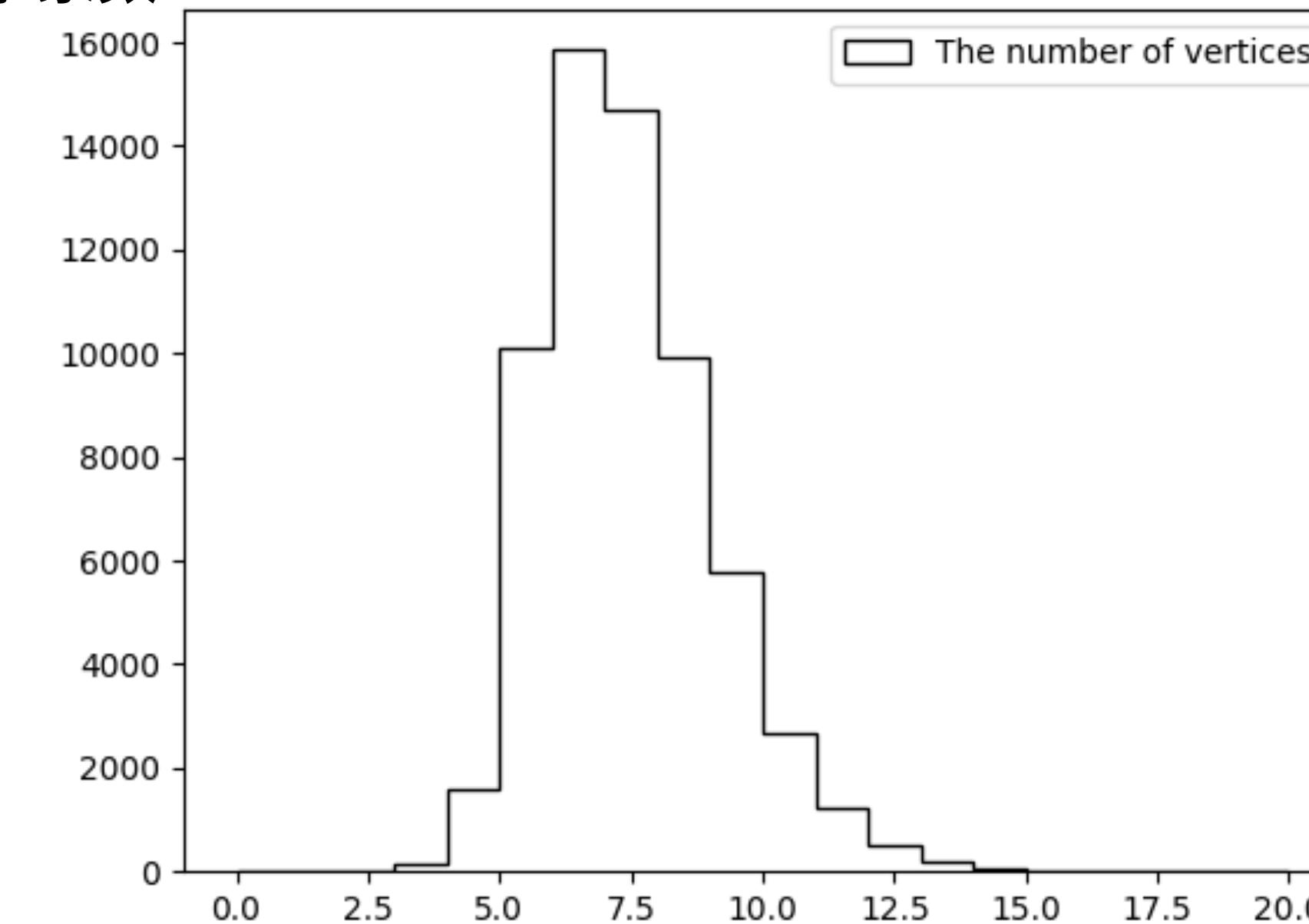


Figure 2: The projection of a helix in the sz plane is a straight line (see Eq. 10). The variable s at a point \mathbf{P} is the arc length in the xy plane from \mathbf{P}^0 to \mathbf{P} . This also implies that $s = 0$, if $z = z_0$.

事象数

飛跡数（終状態 $b\bar{b}$ ）

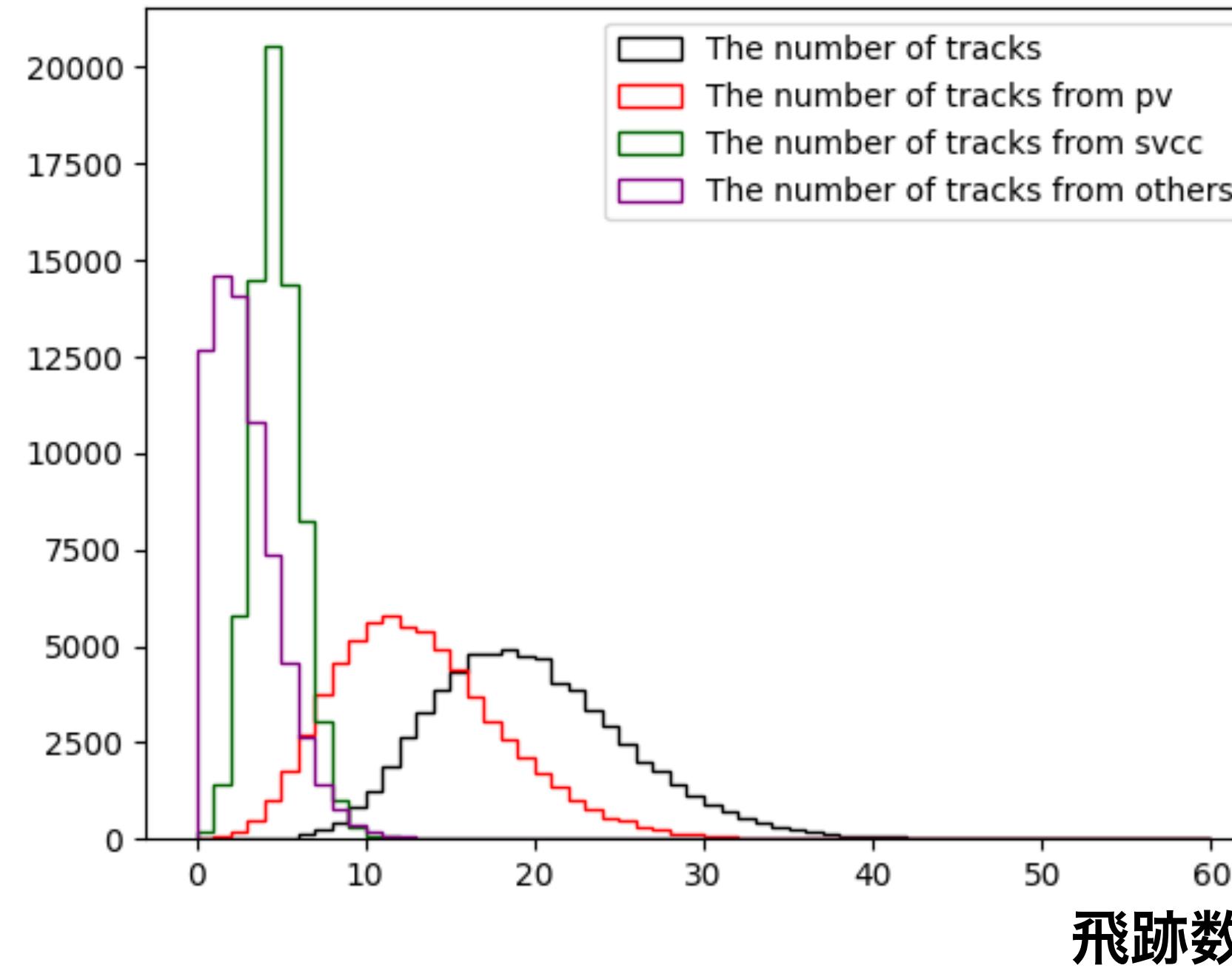
事象数

崩壊点数（終状態 $b\bar{b}$ ）

事象数

飛跡数（終状態 $c\bar{c}$ ）

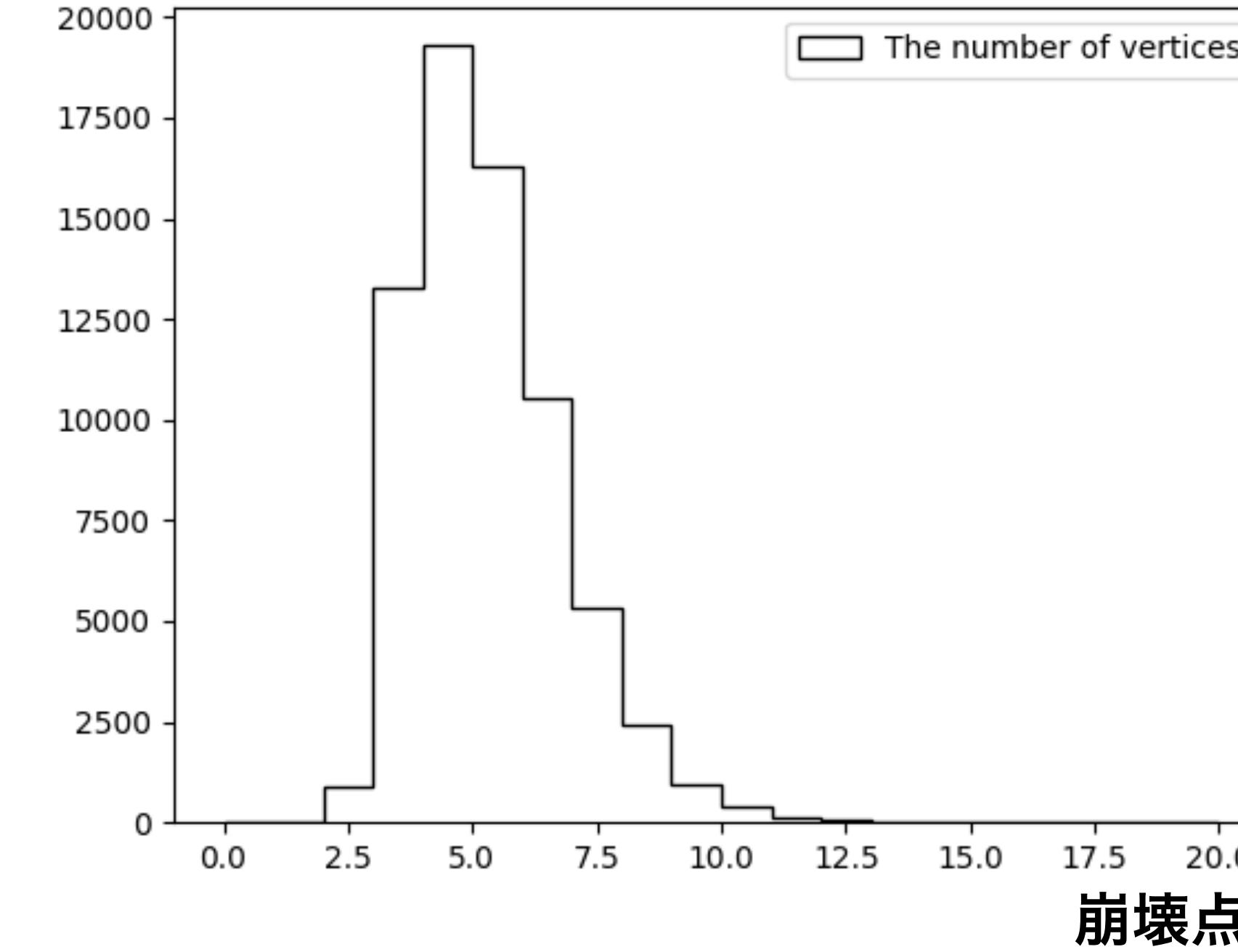
飛跡数



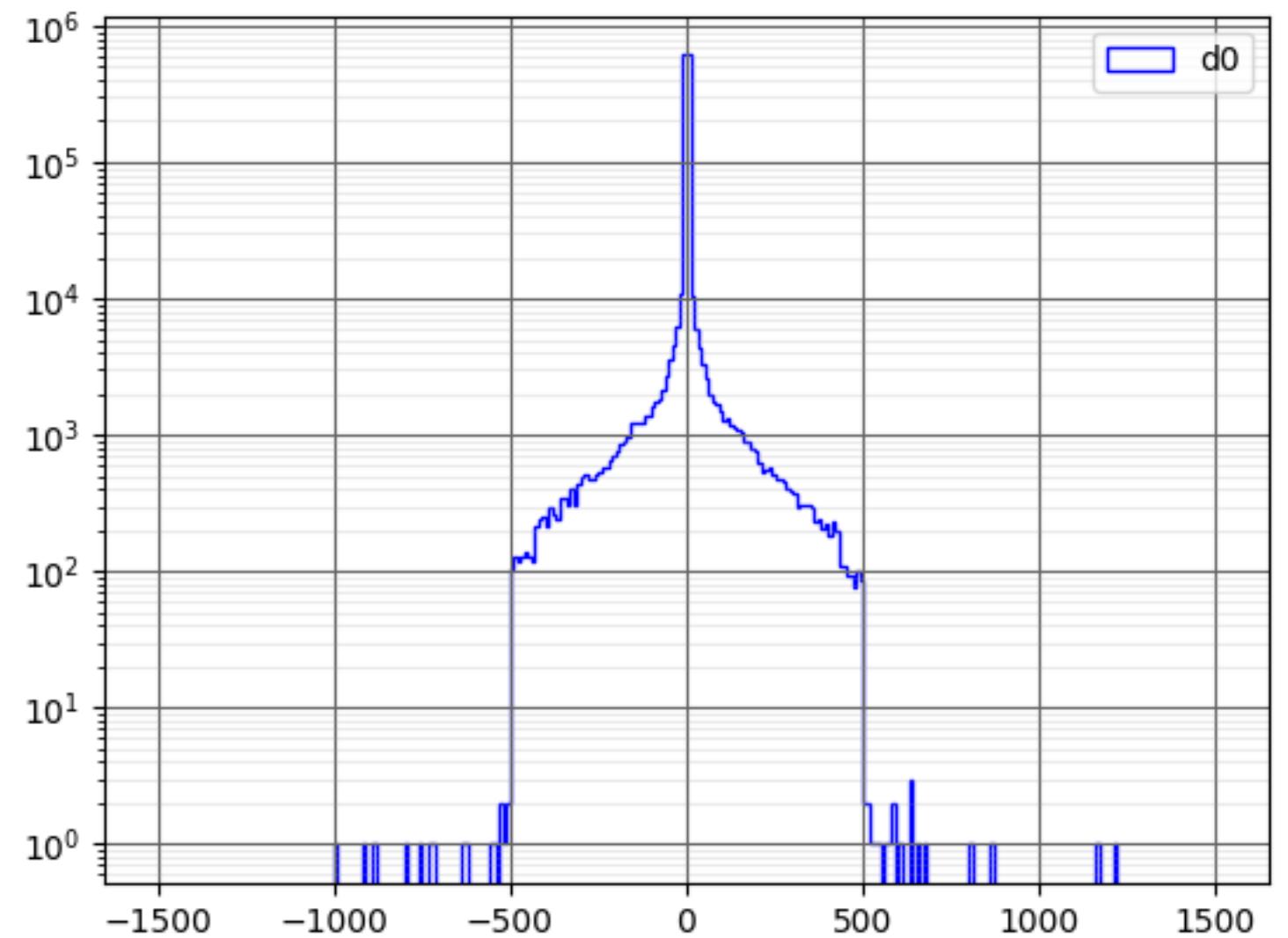
事象数

崩壊点数（終状態 $c\bar{c}$ ）

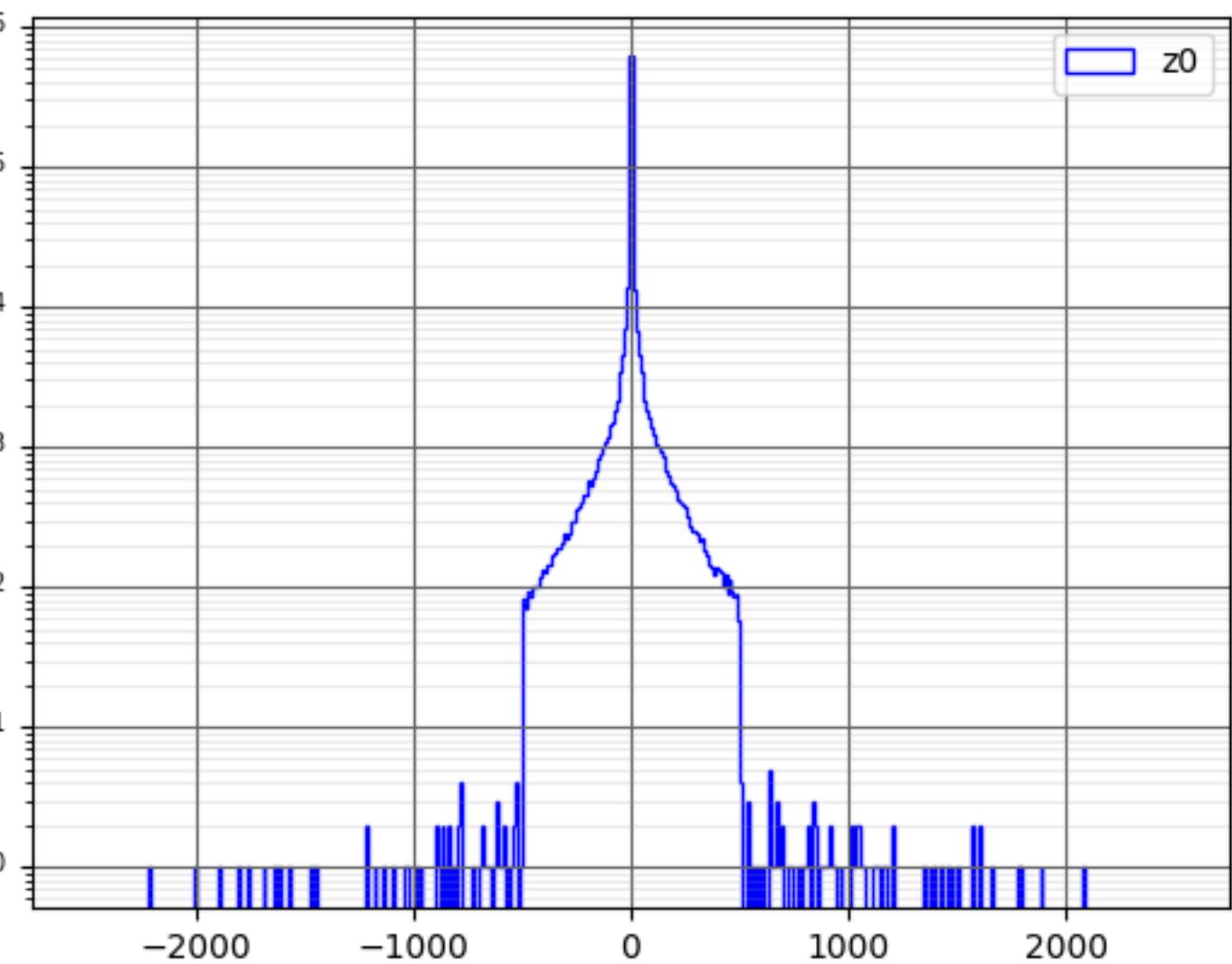
崩壊点数



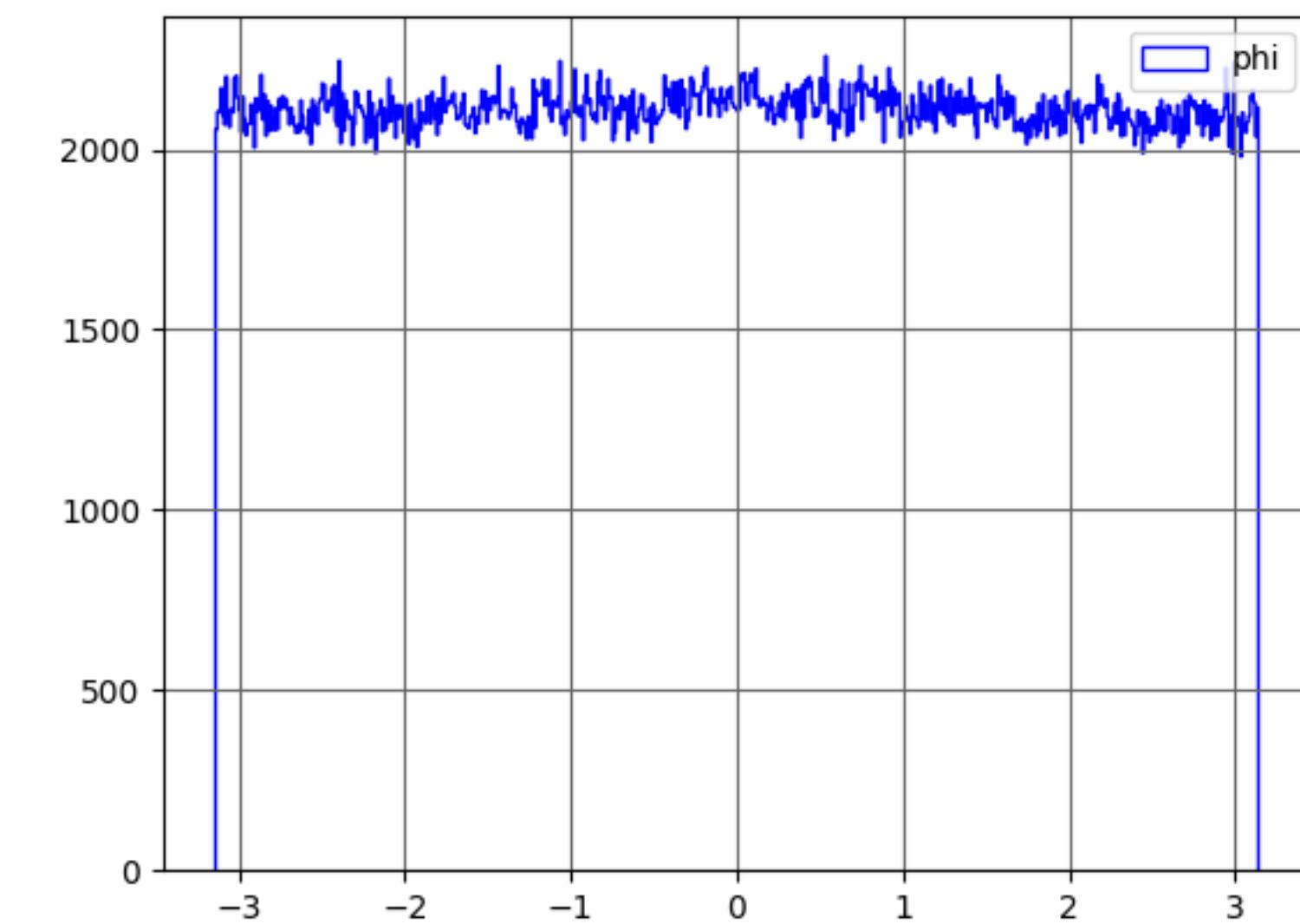
終狀態 $b\bar{b}$



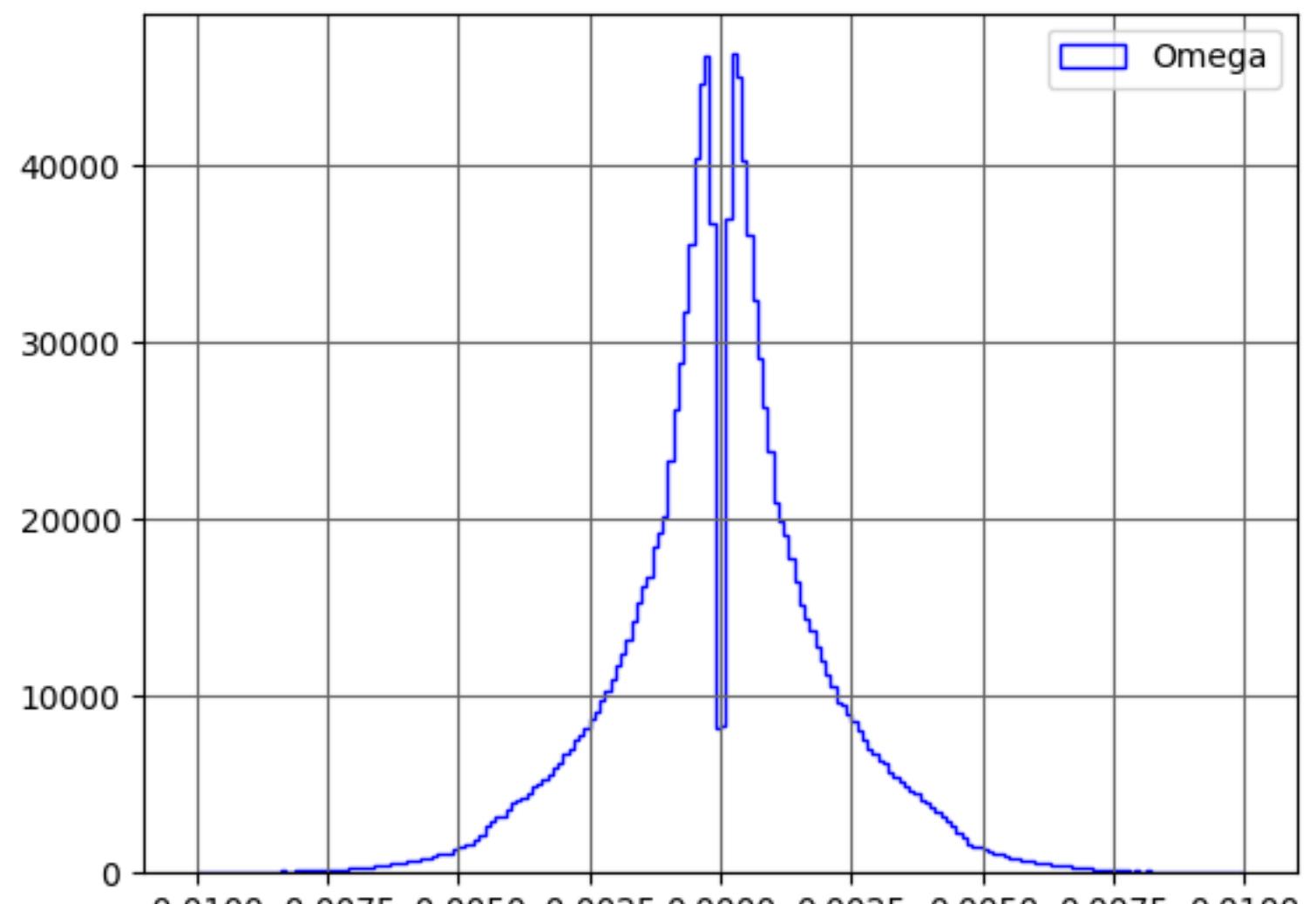
d_0



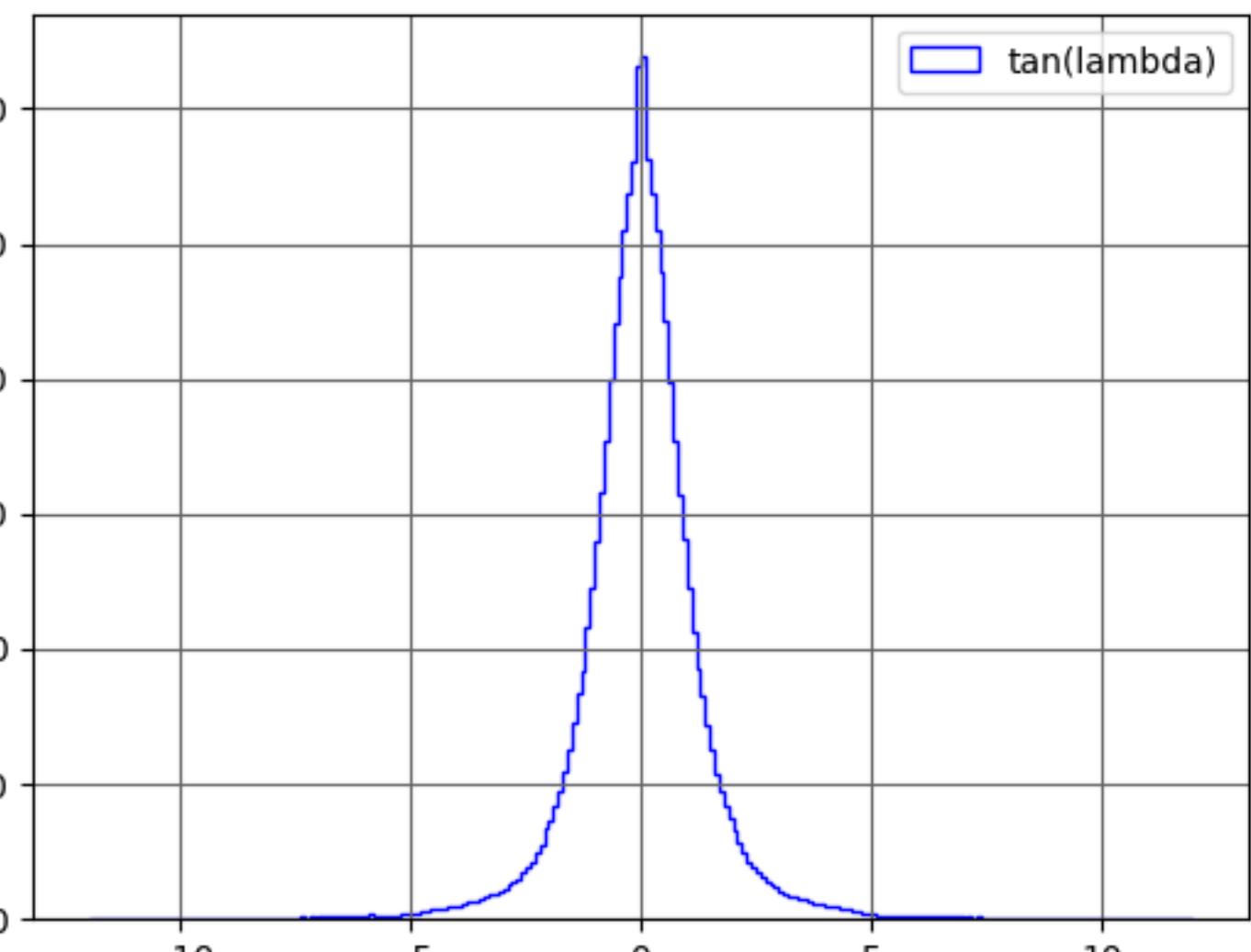
z_0



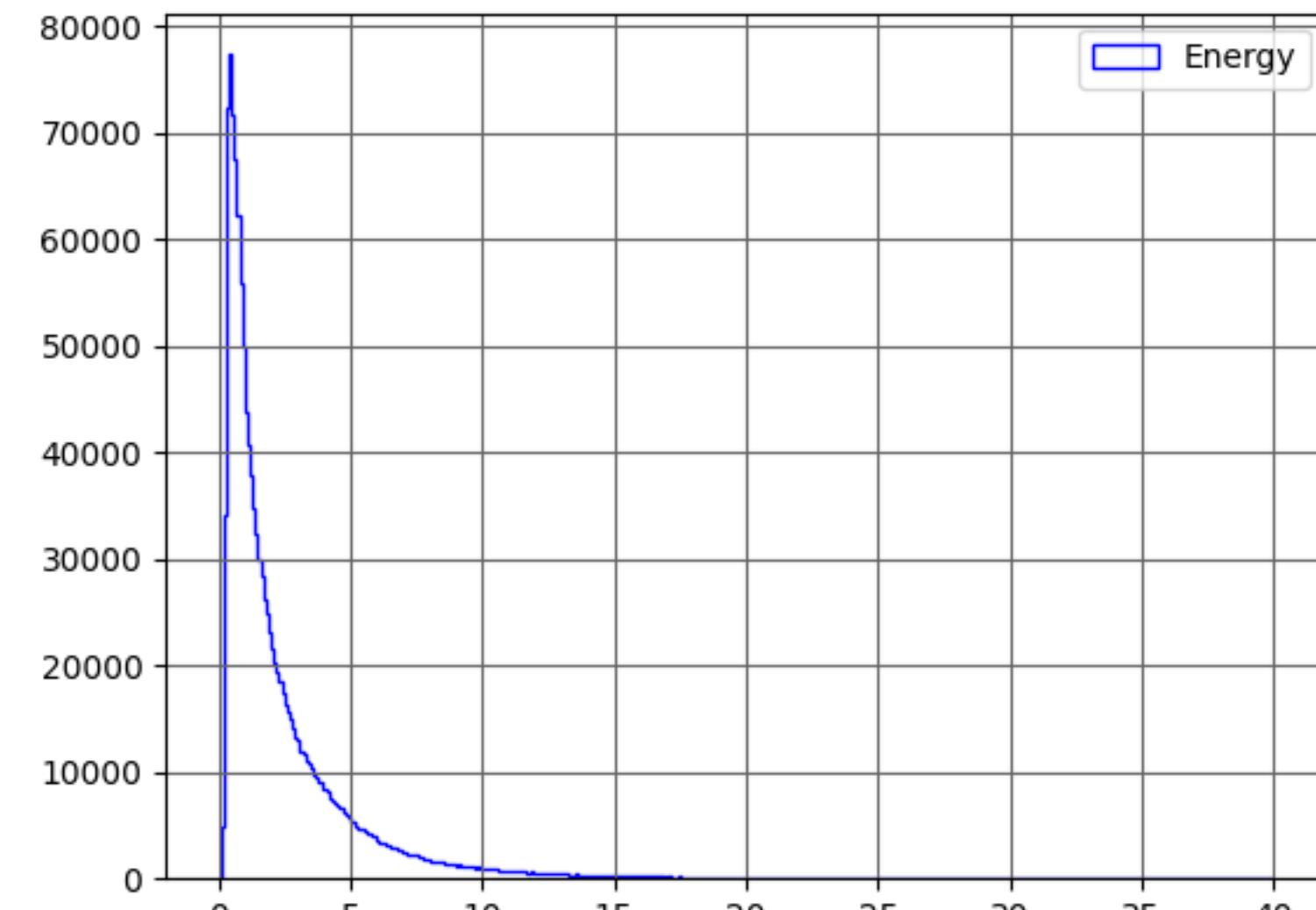
ϕ



Ω

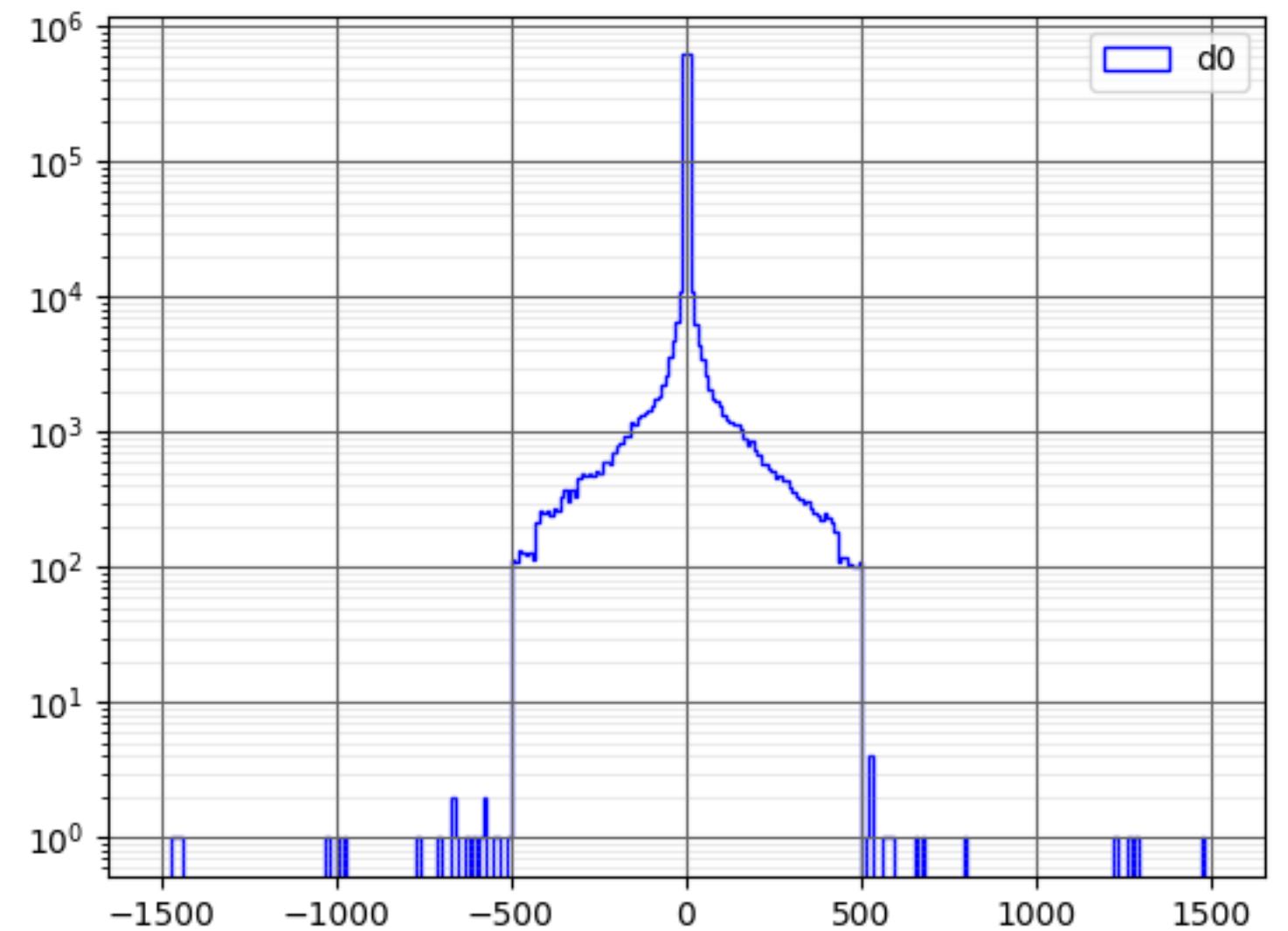


$\tan(\lambda)$

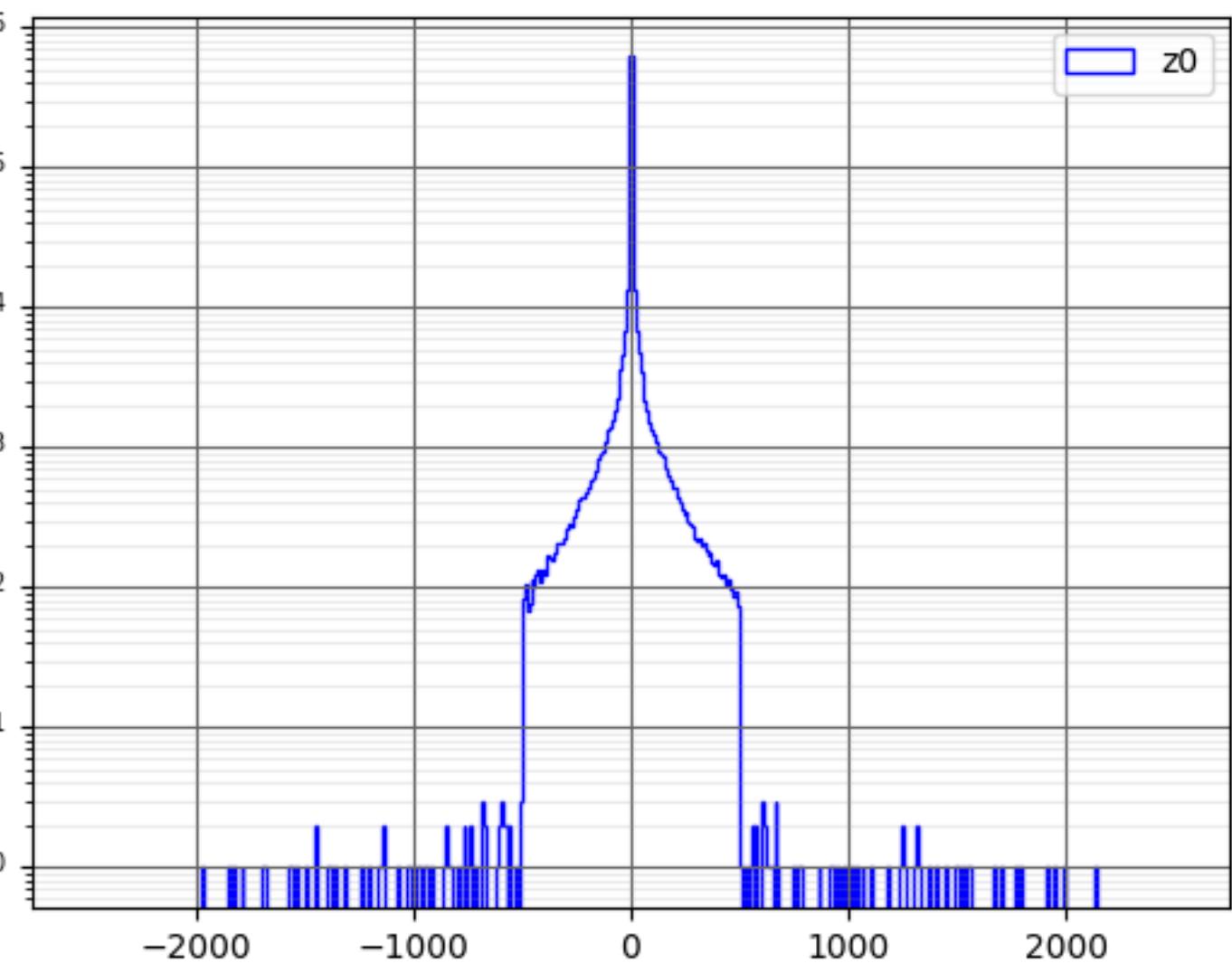


Energy

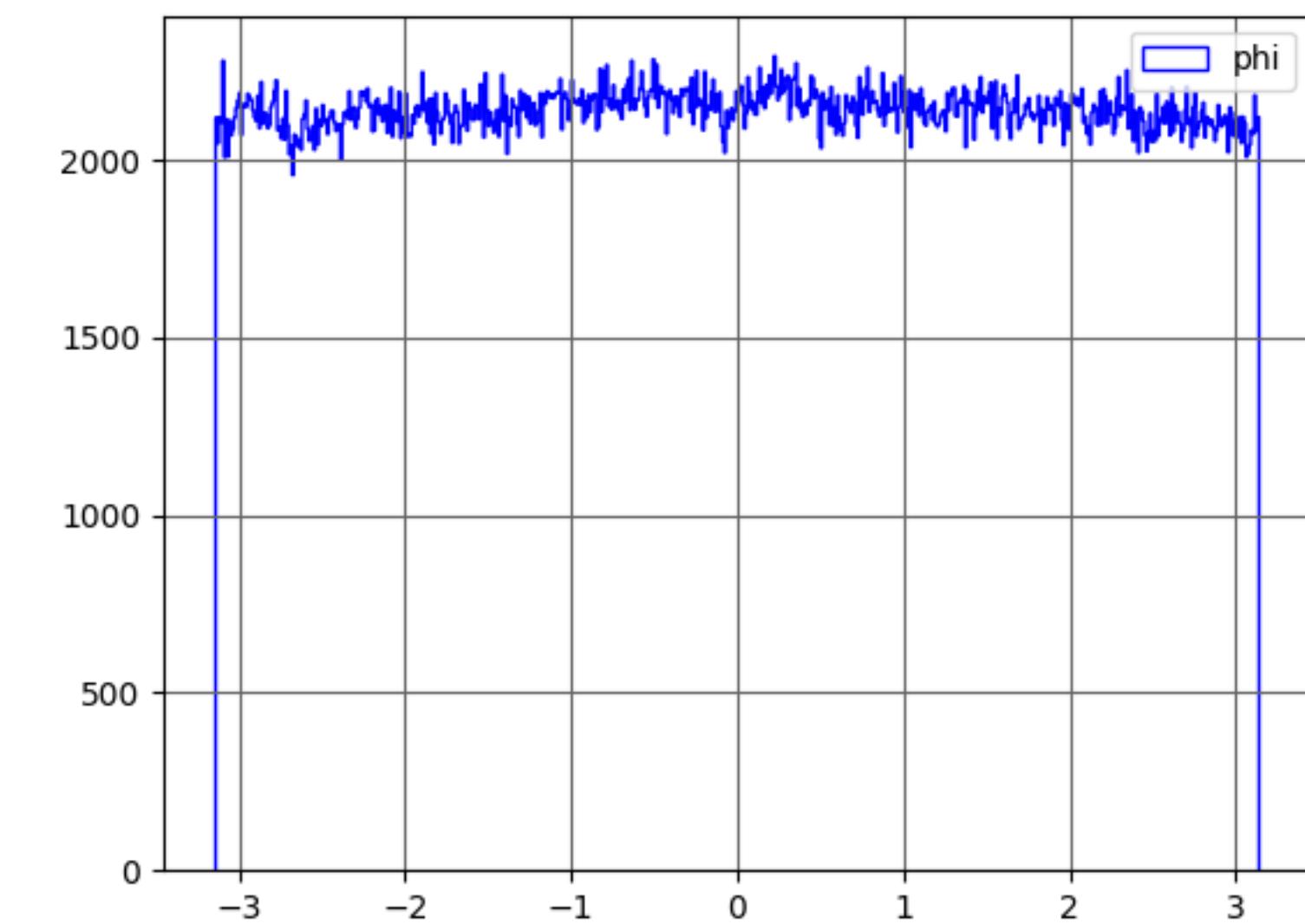
終狀態 $c\bar{c}$



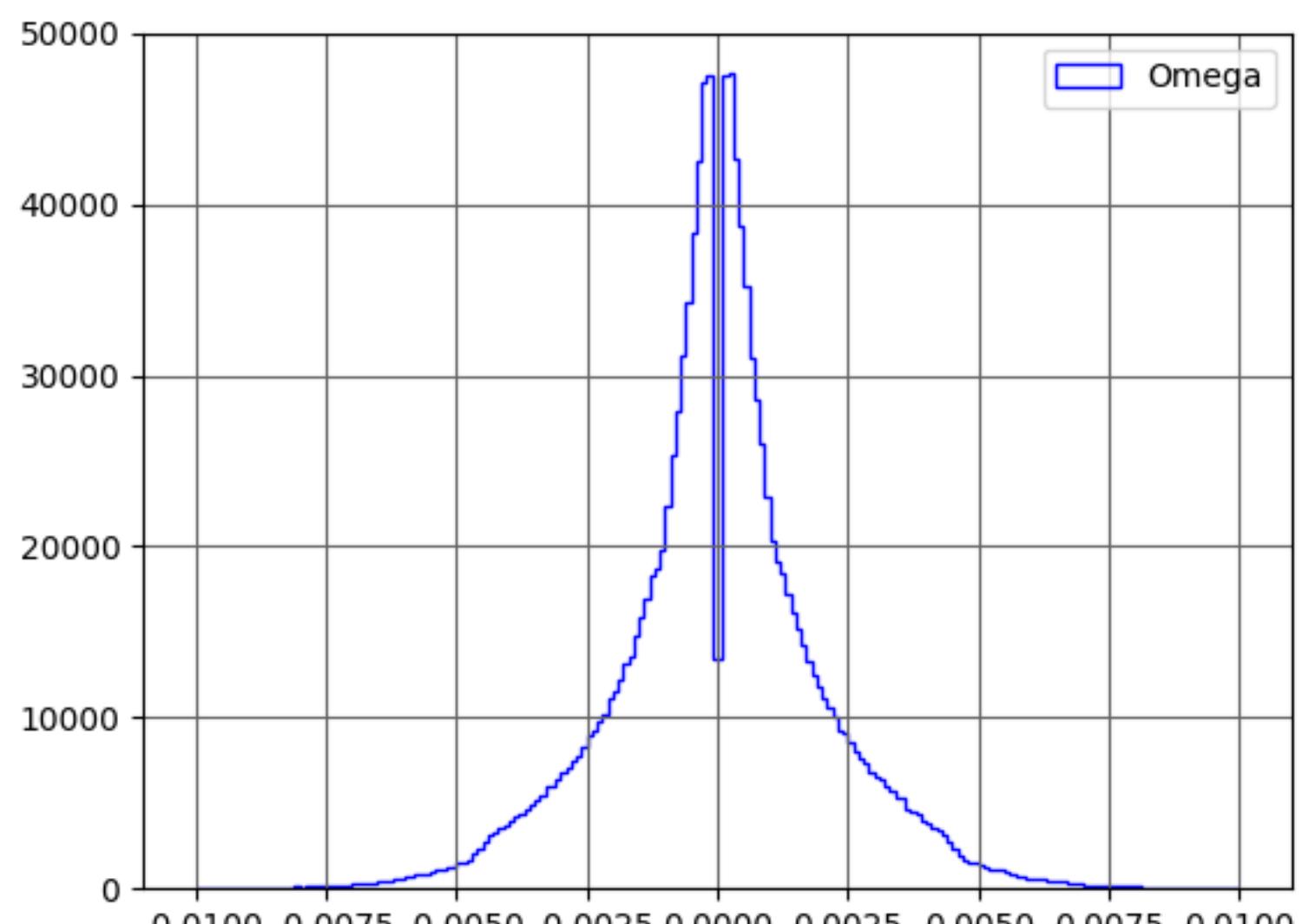
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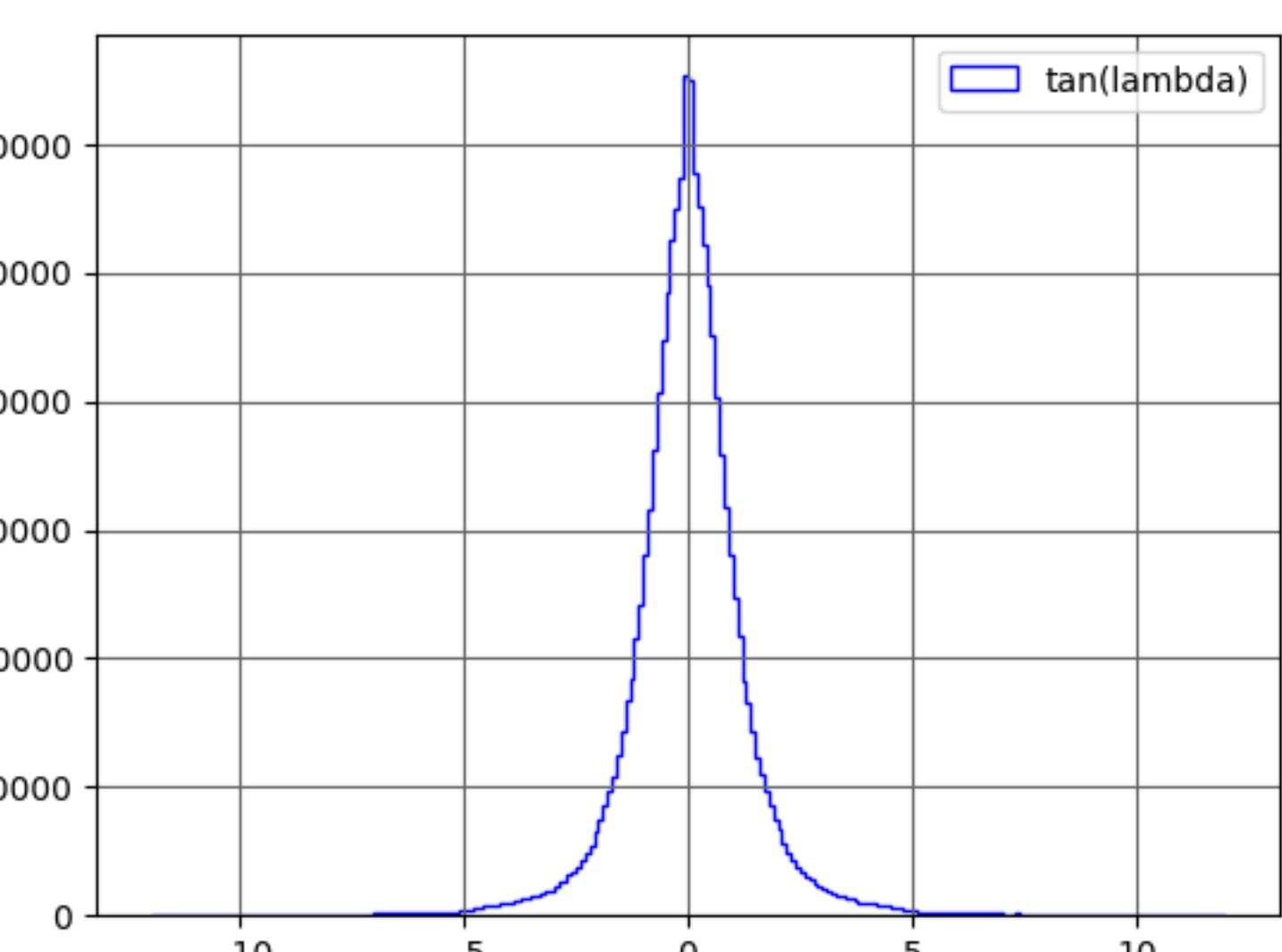
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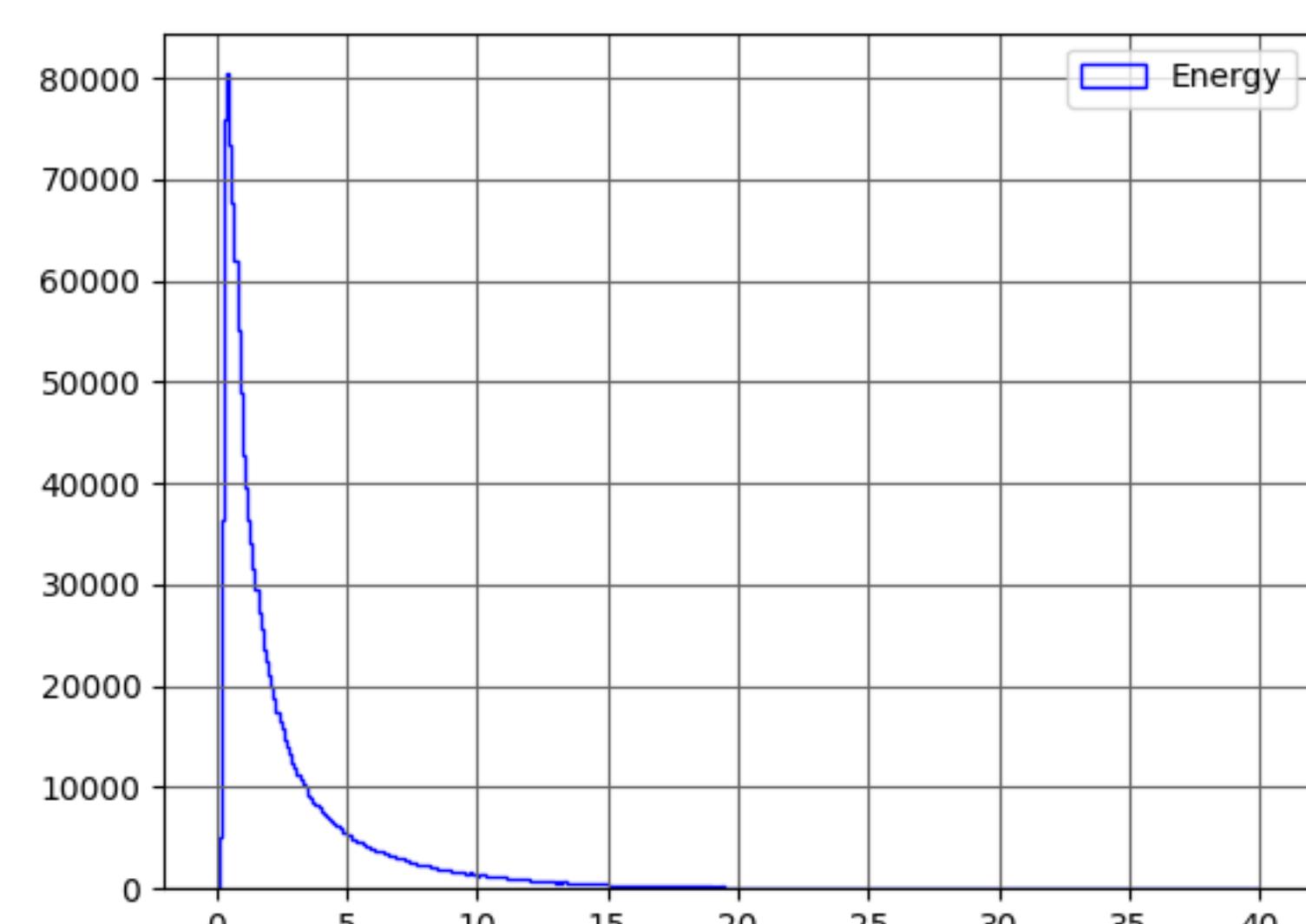
ϕ



Ω

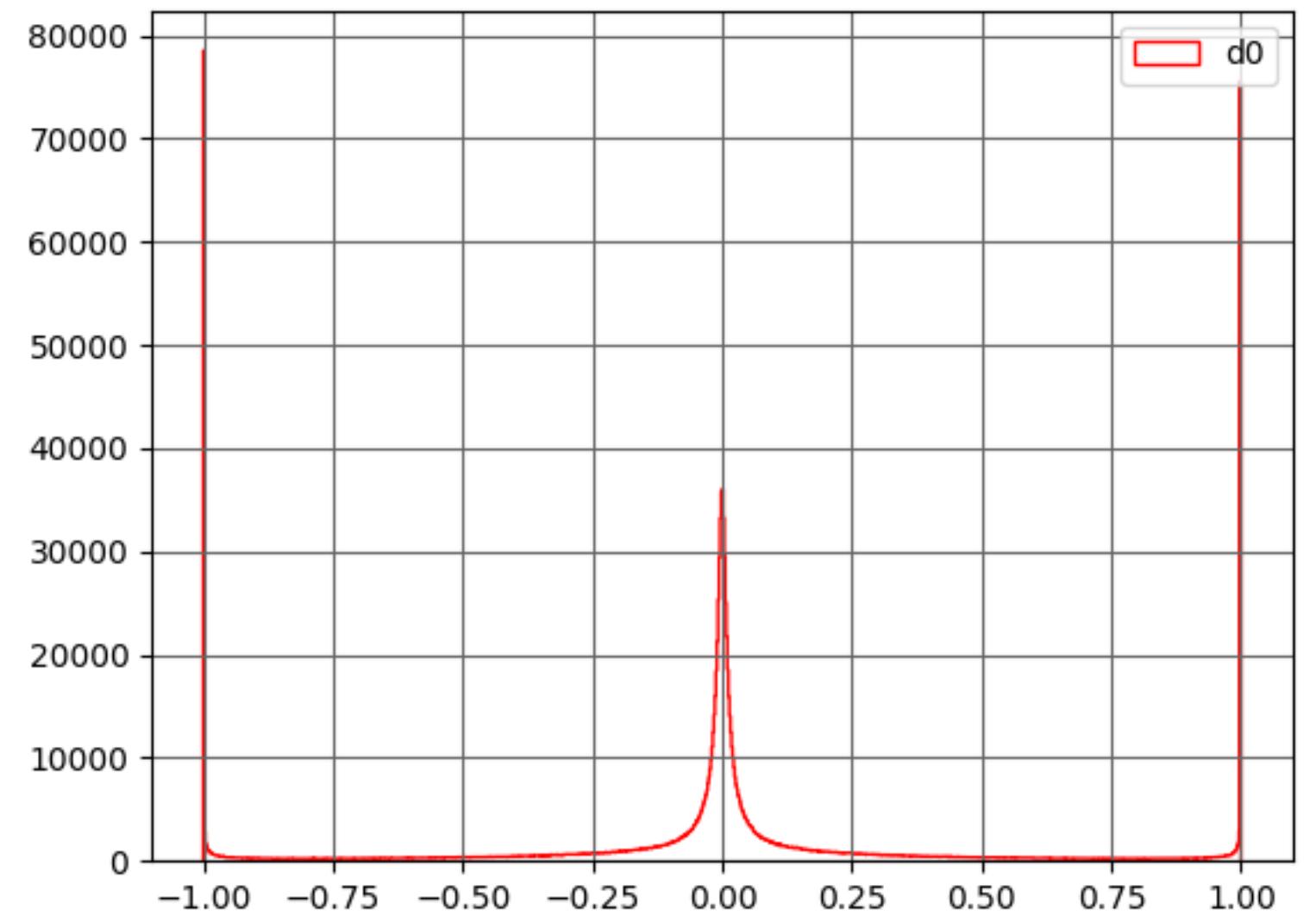


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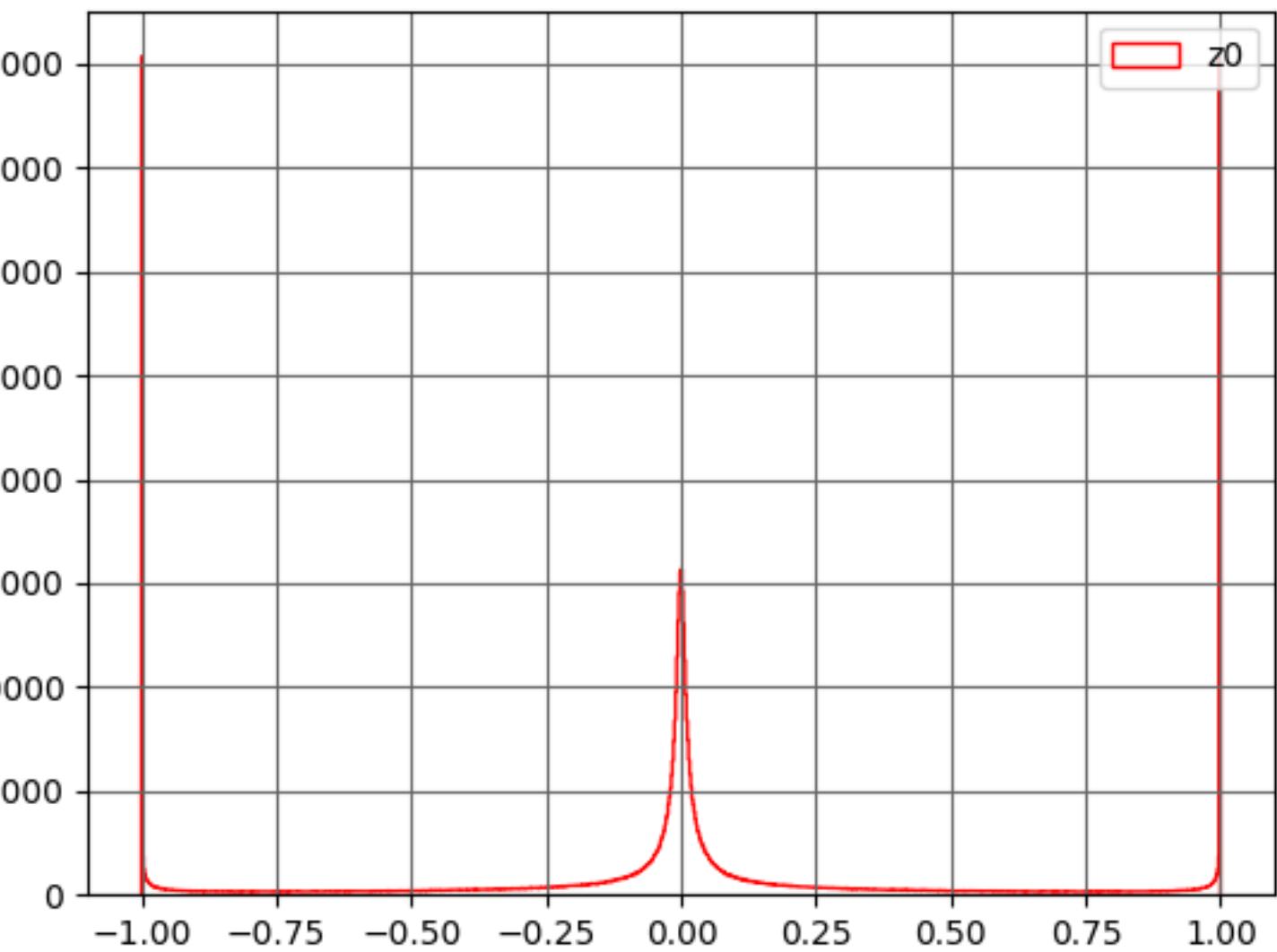


Energy

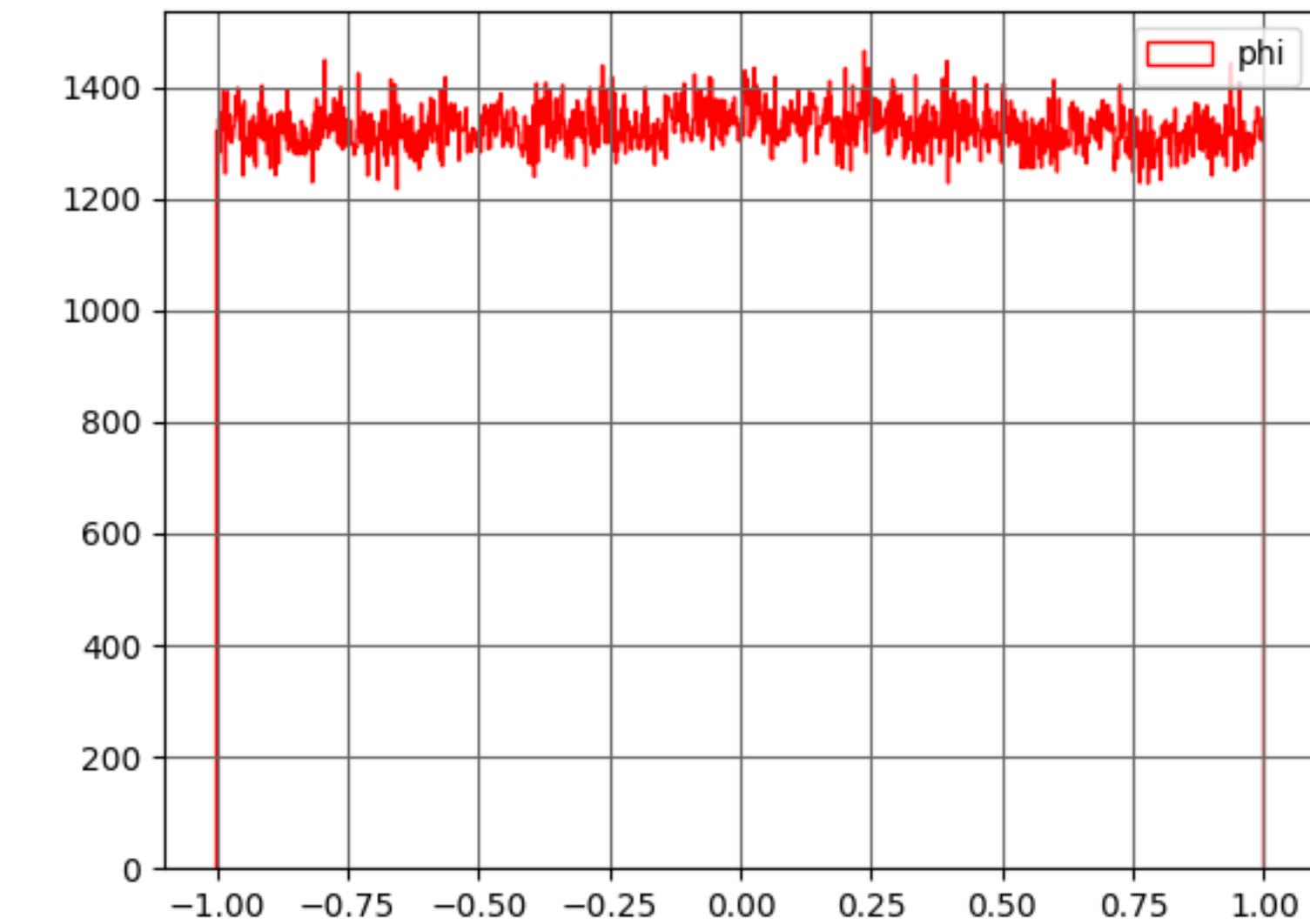
終狀態 $b\bar{b}$



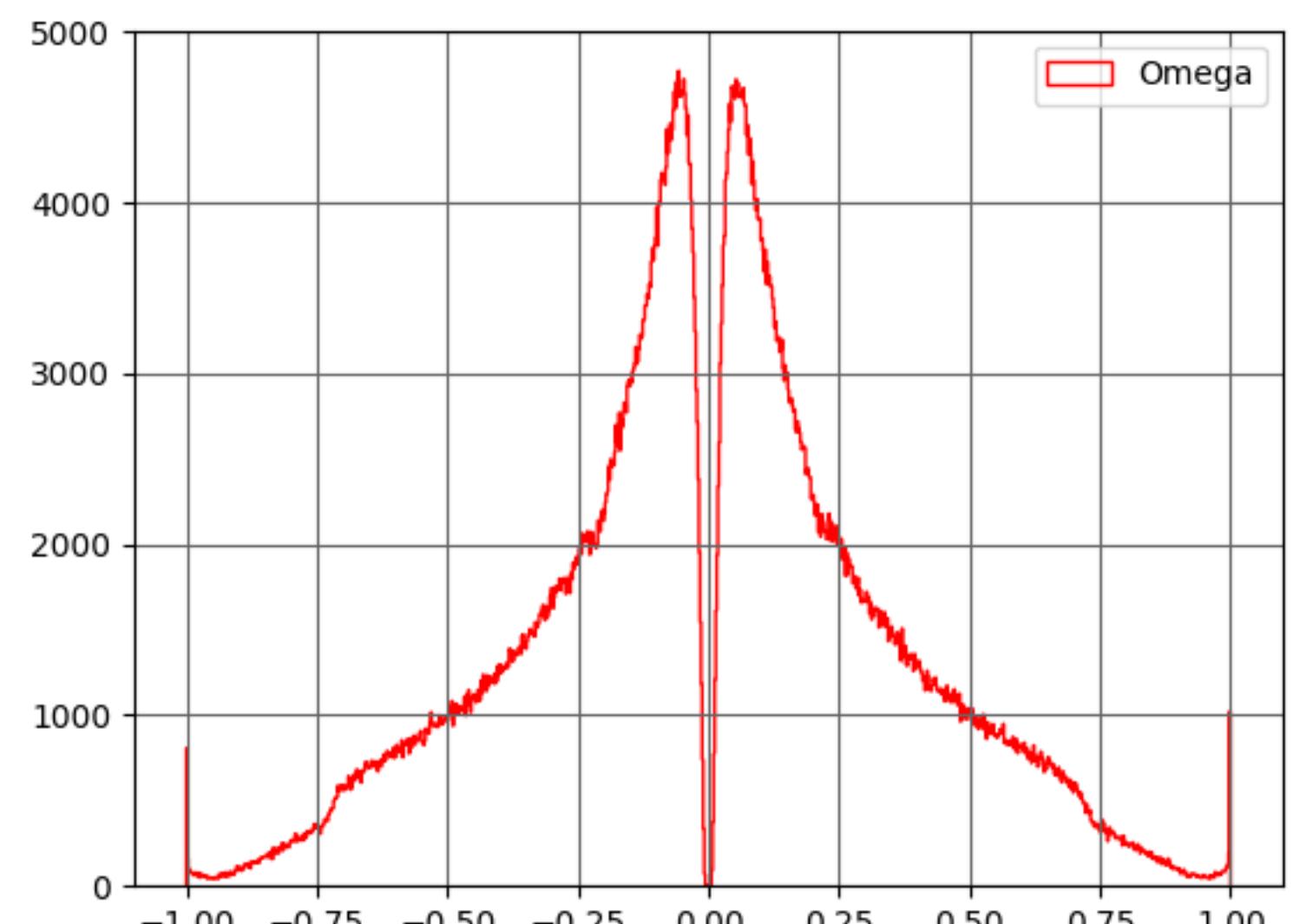
d_0



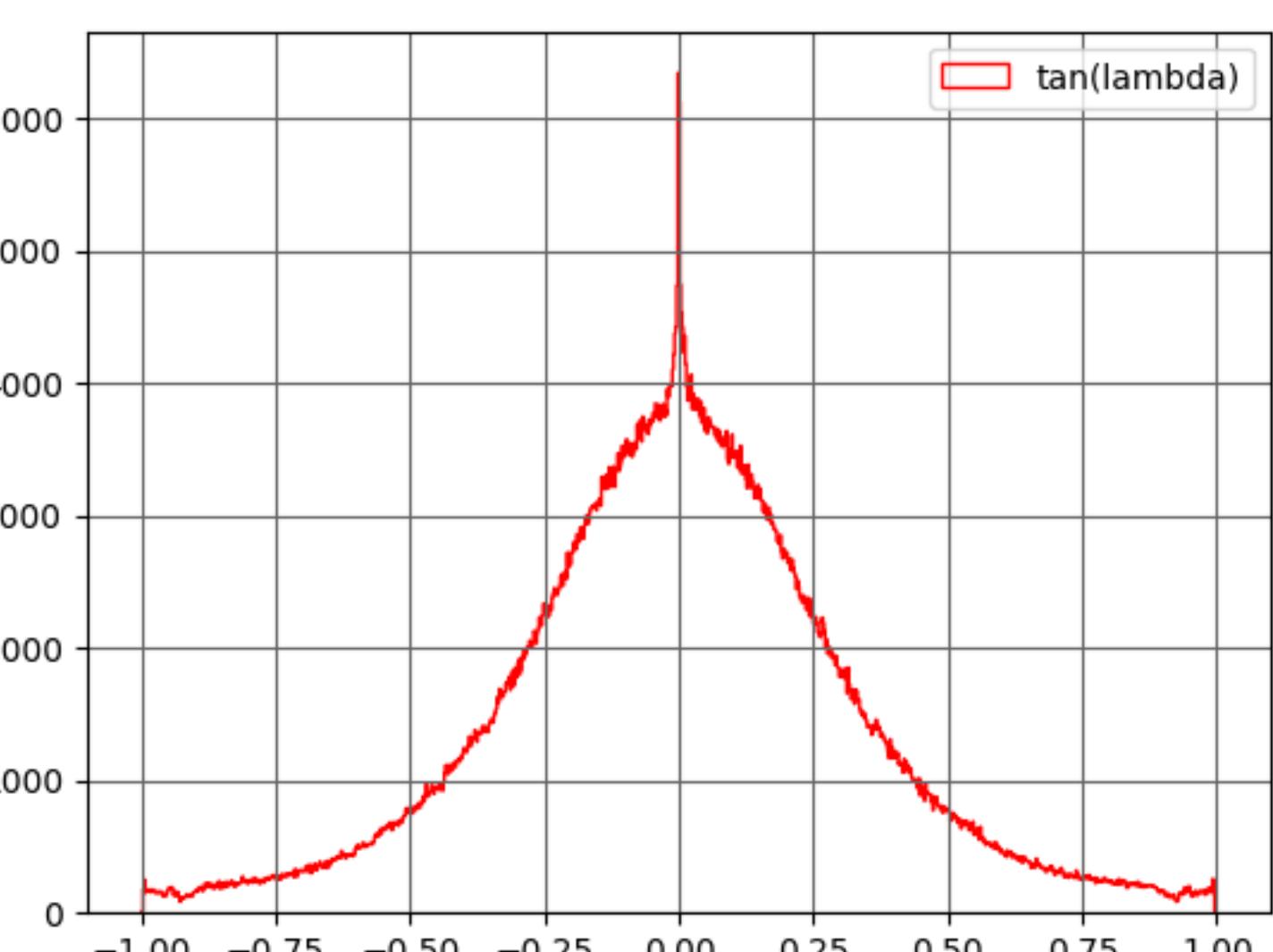
z_0



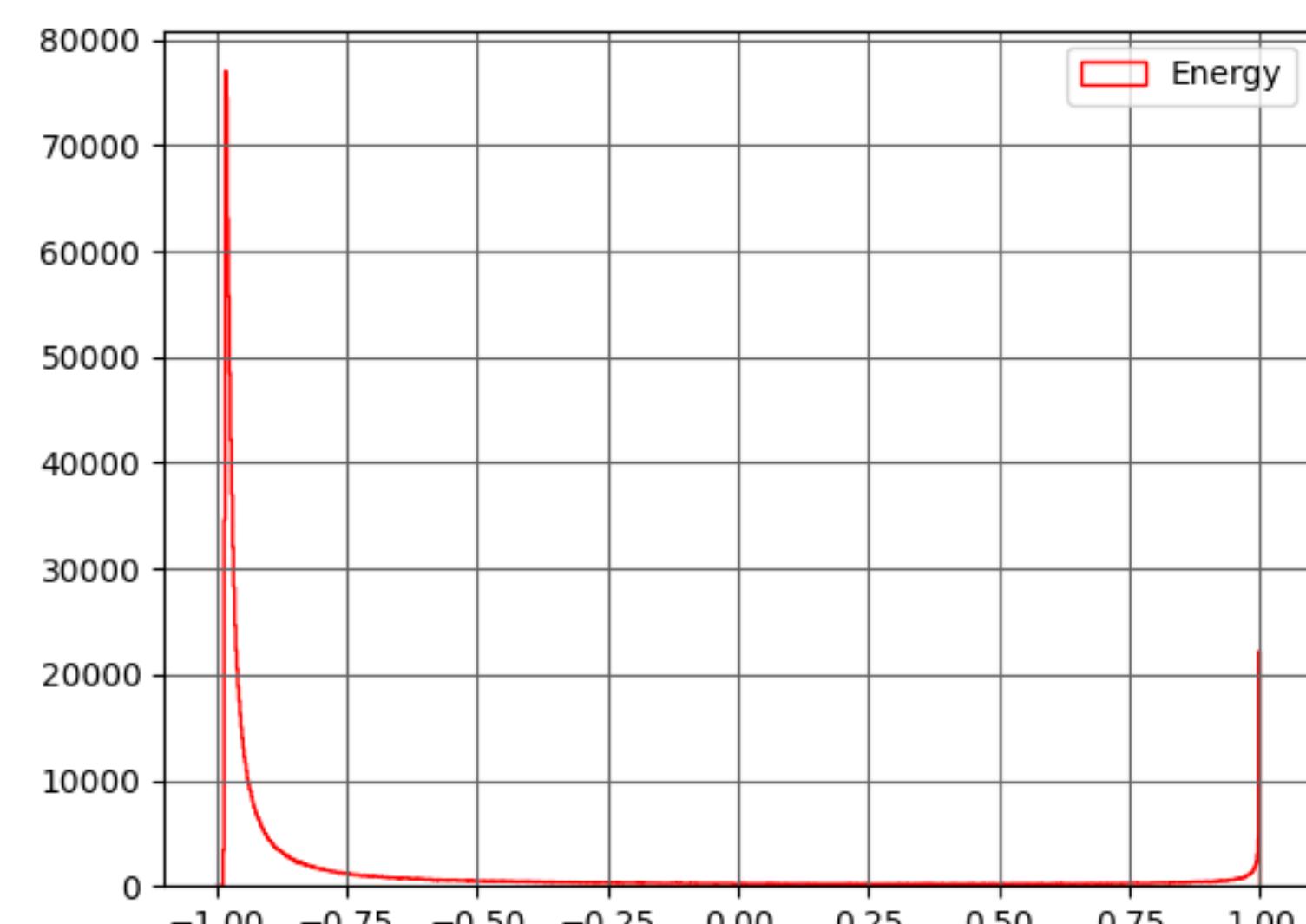
ϕ



Ω

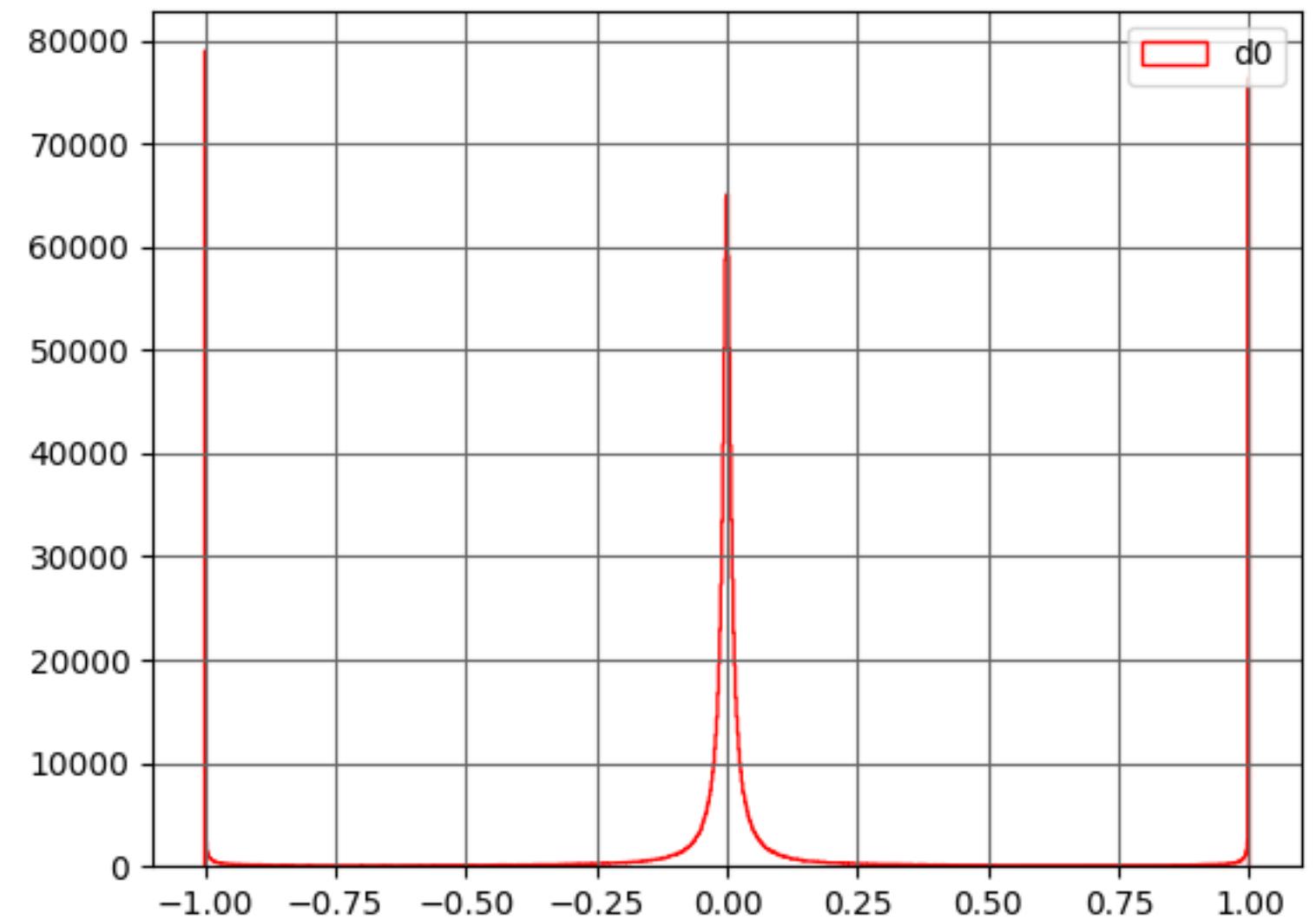


$\tan(\lambda)$

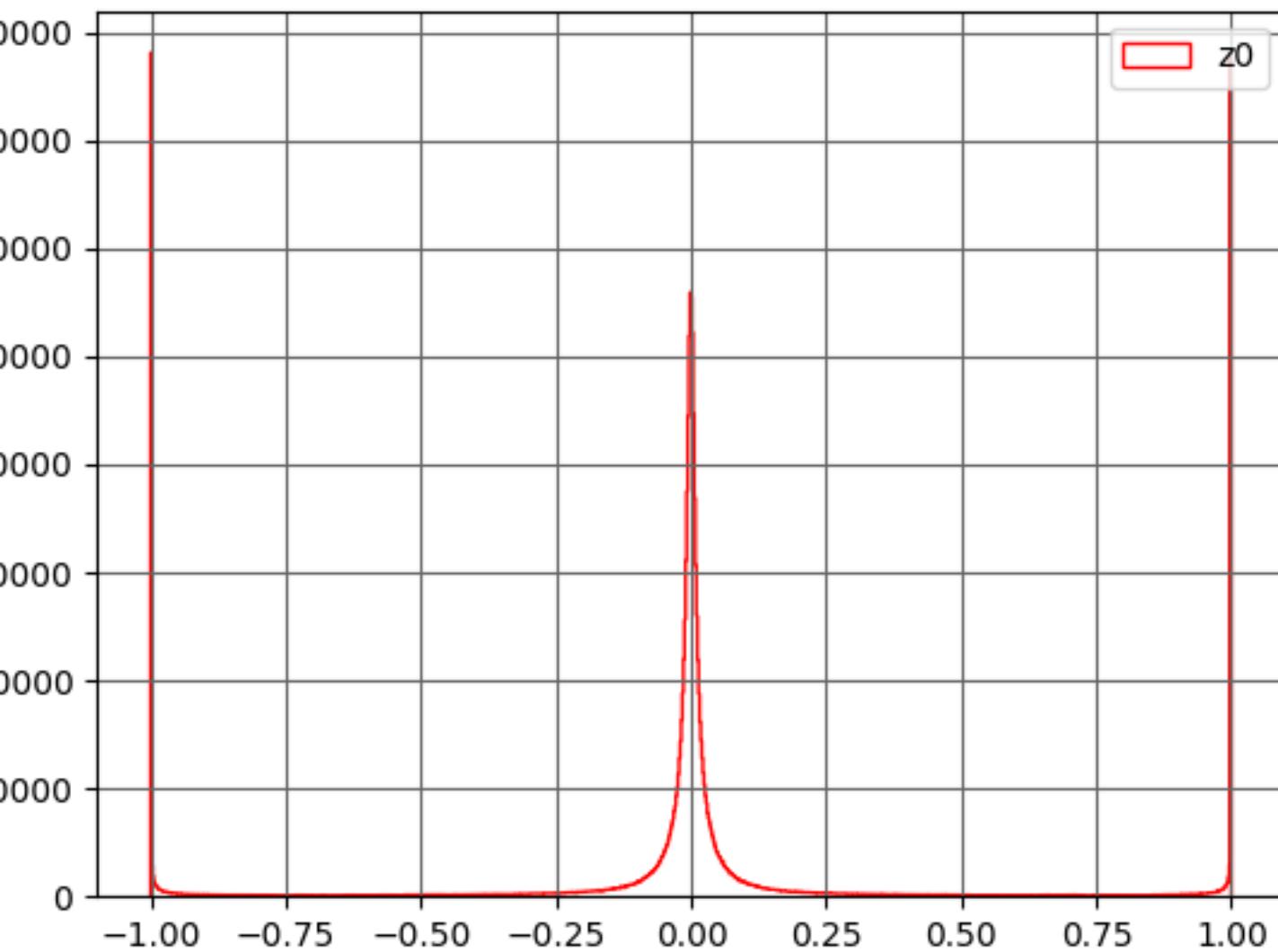


Energy

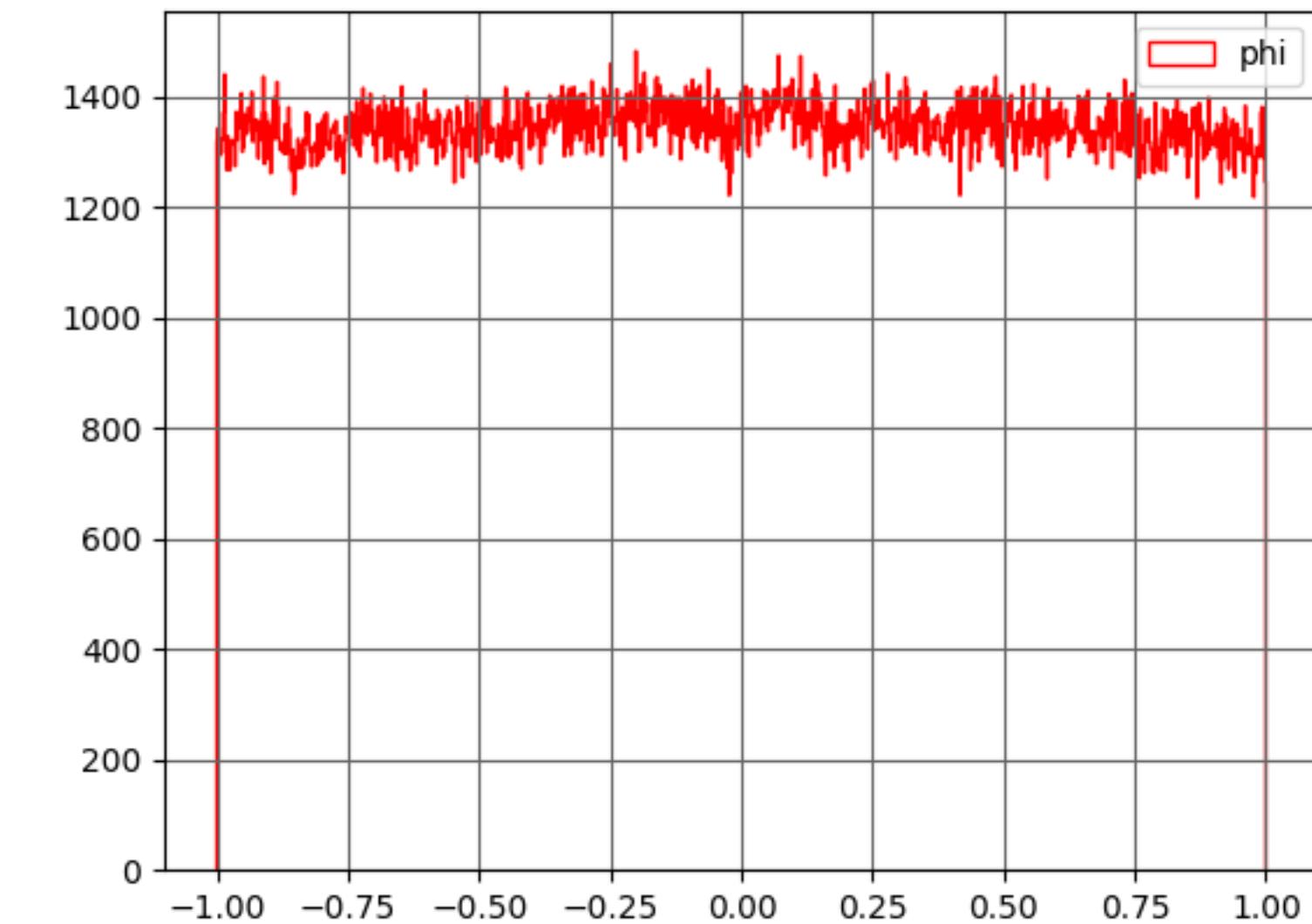
終狀態 $c\bar{c}$



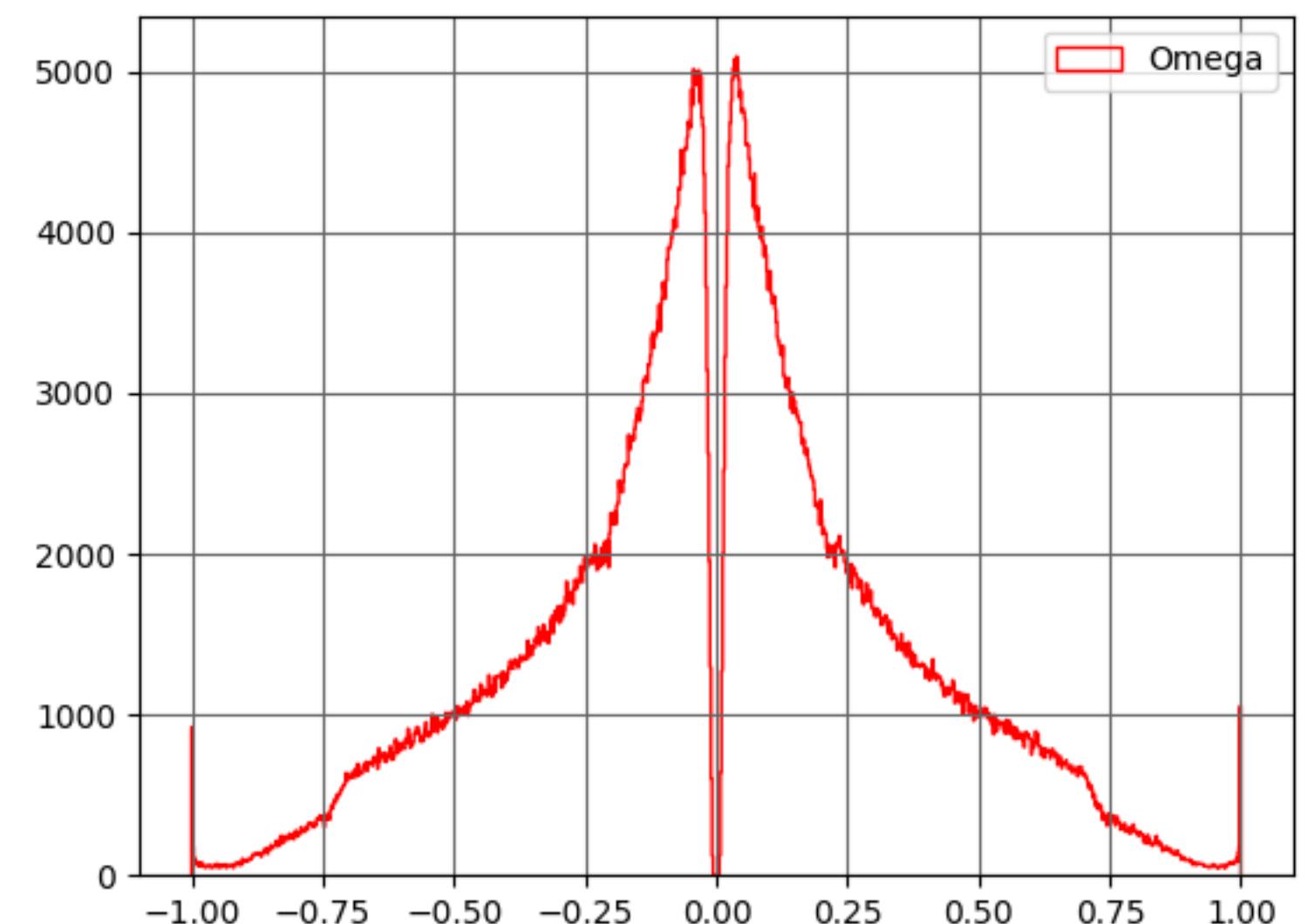
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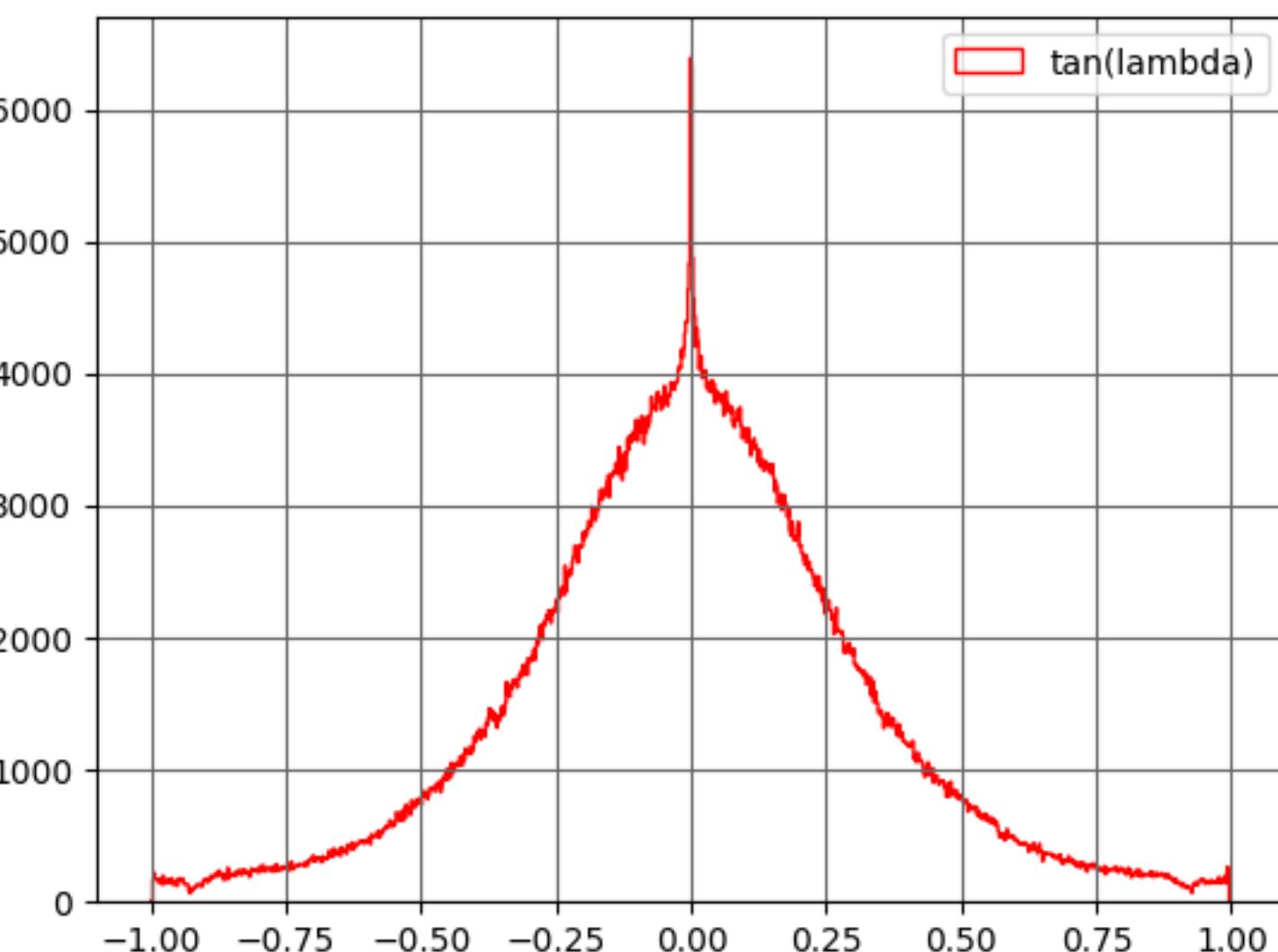
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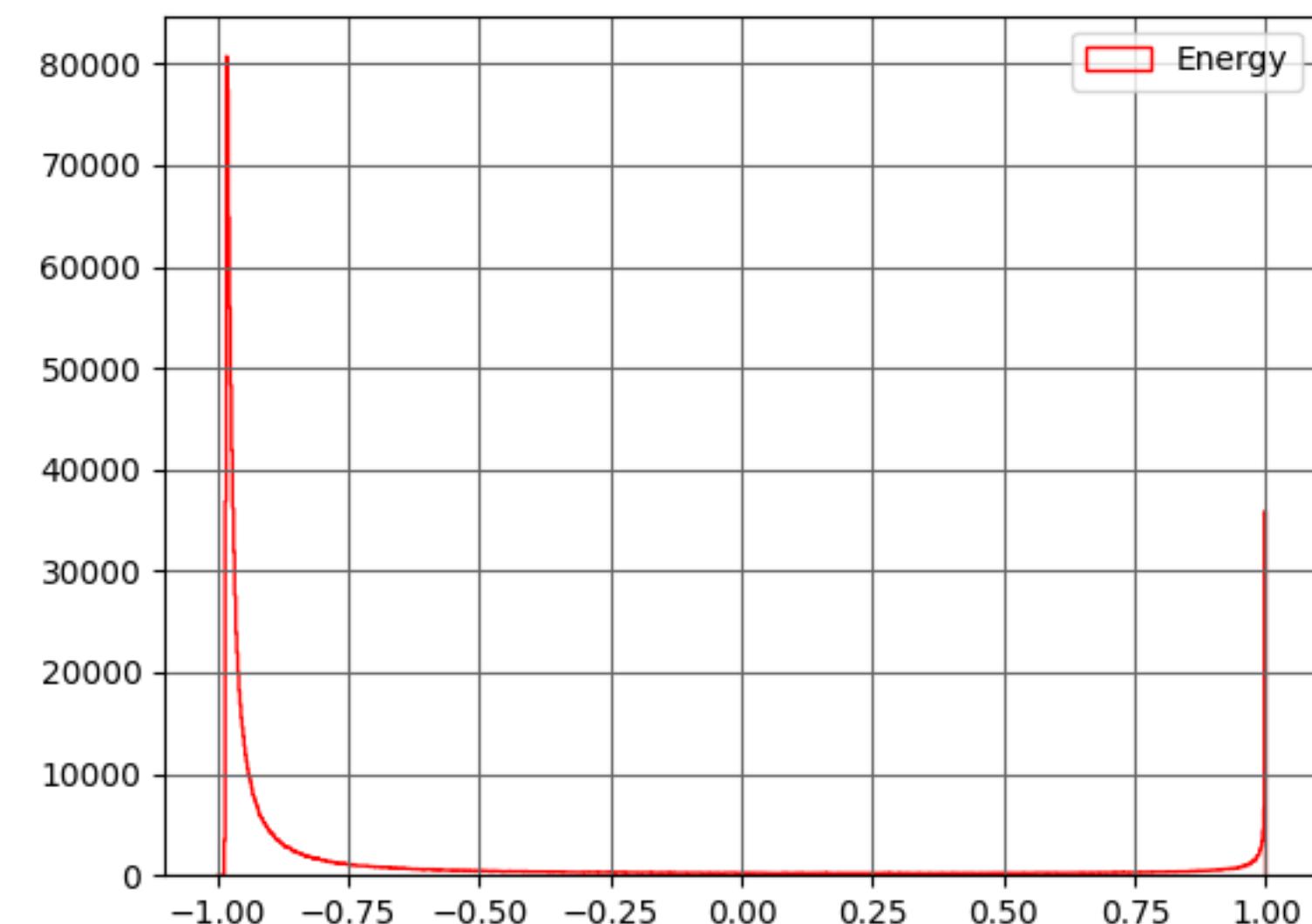
ϕ



Ω

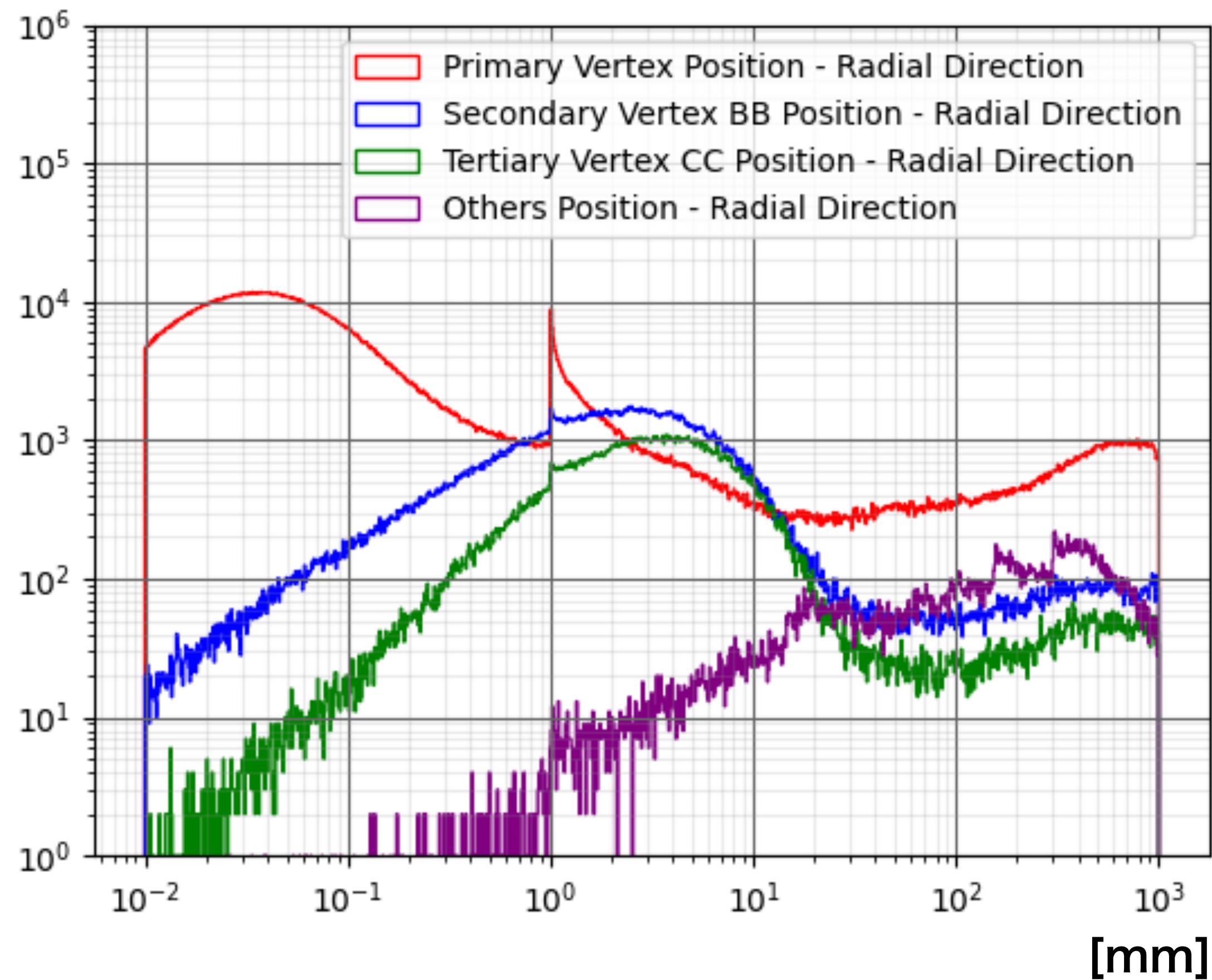


$\tan(\lambda)$

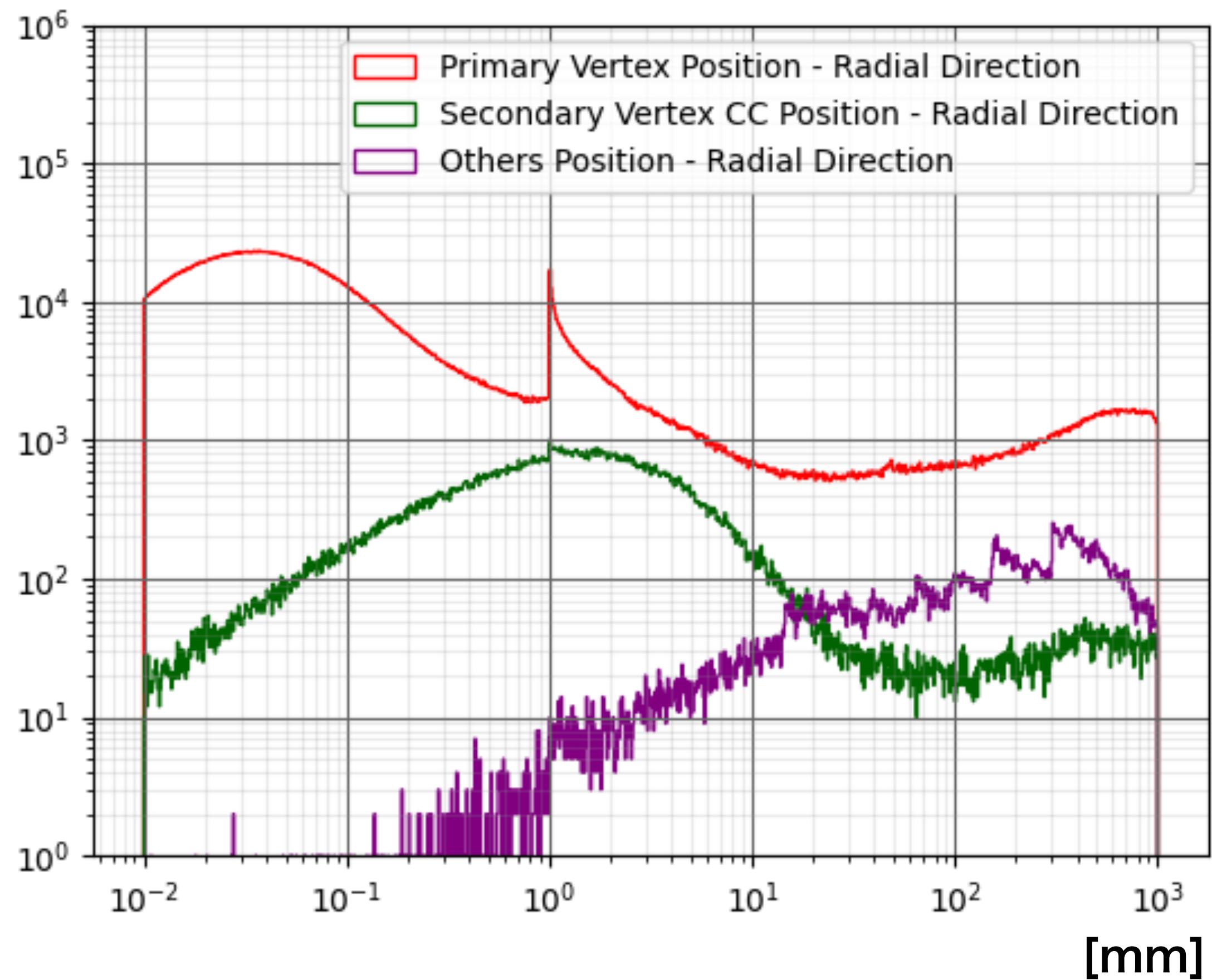


Energy

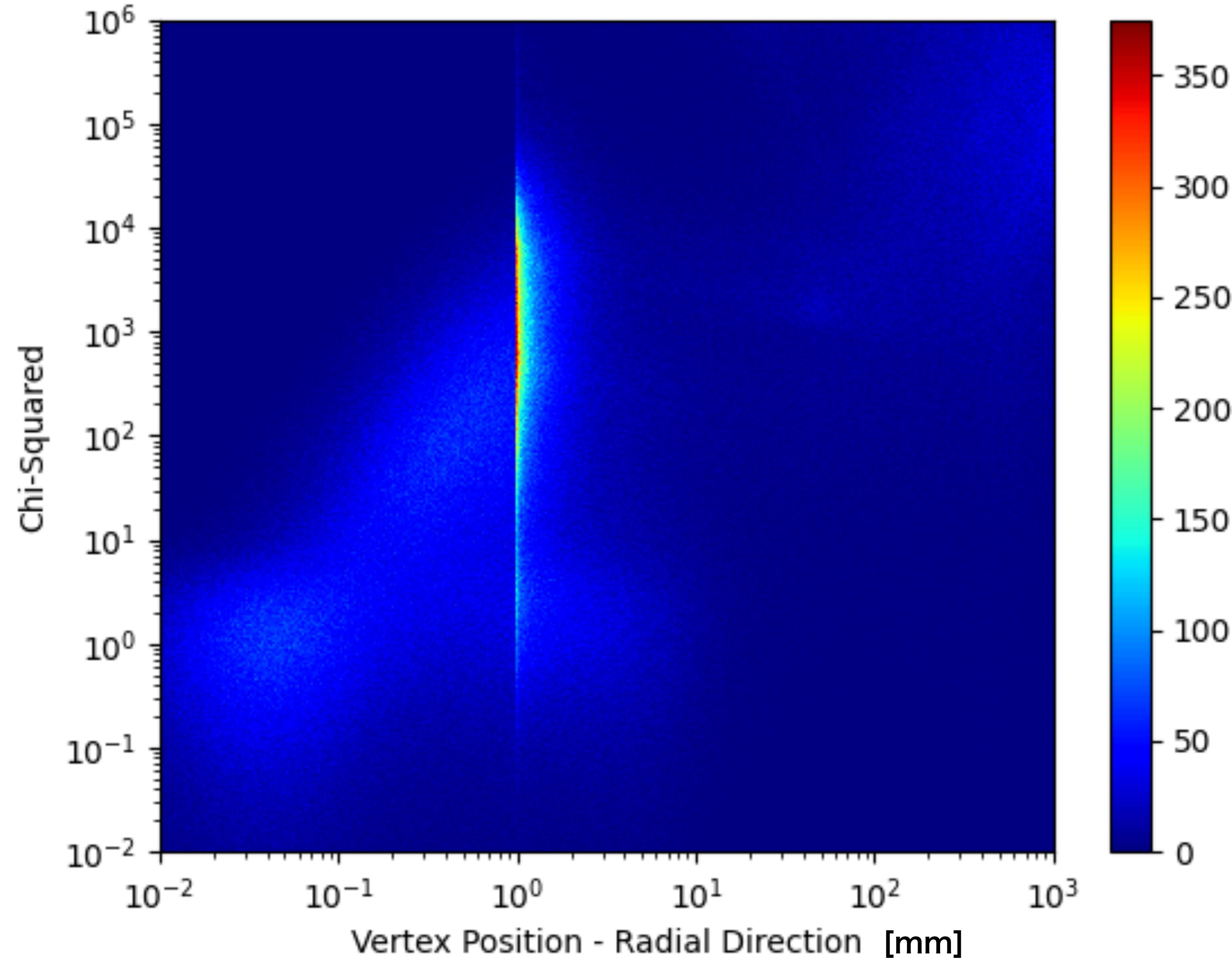
終状態 $b\bar{b}$



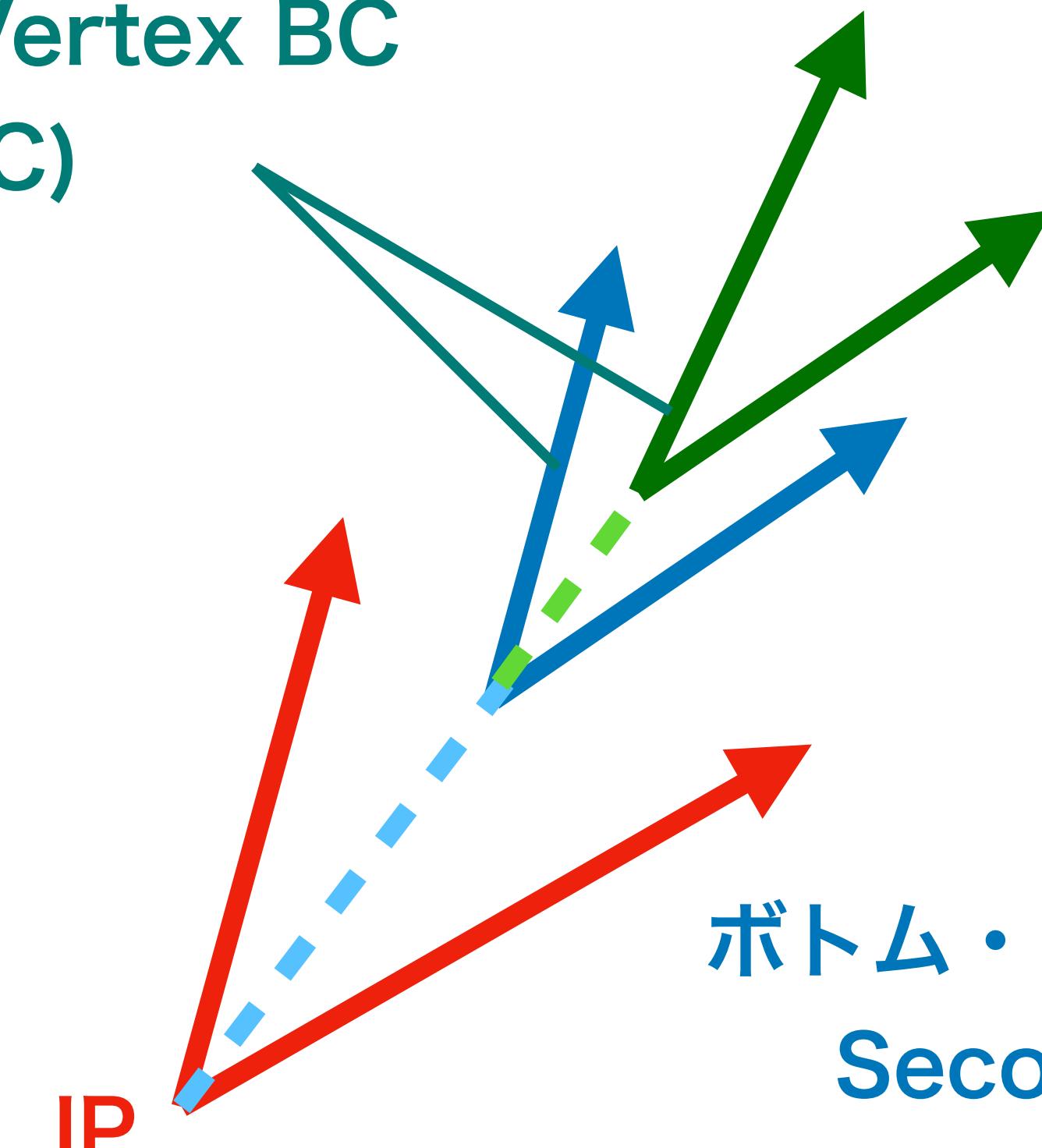
終状態 $c\bar{c}$



終状態 $b\bar{b}$



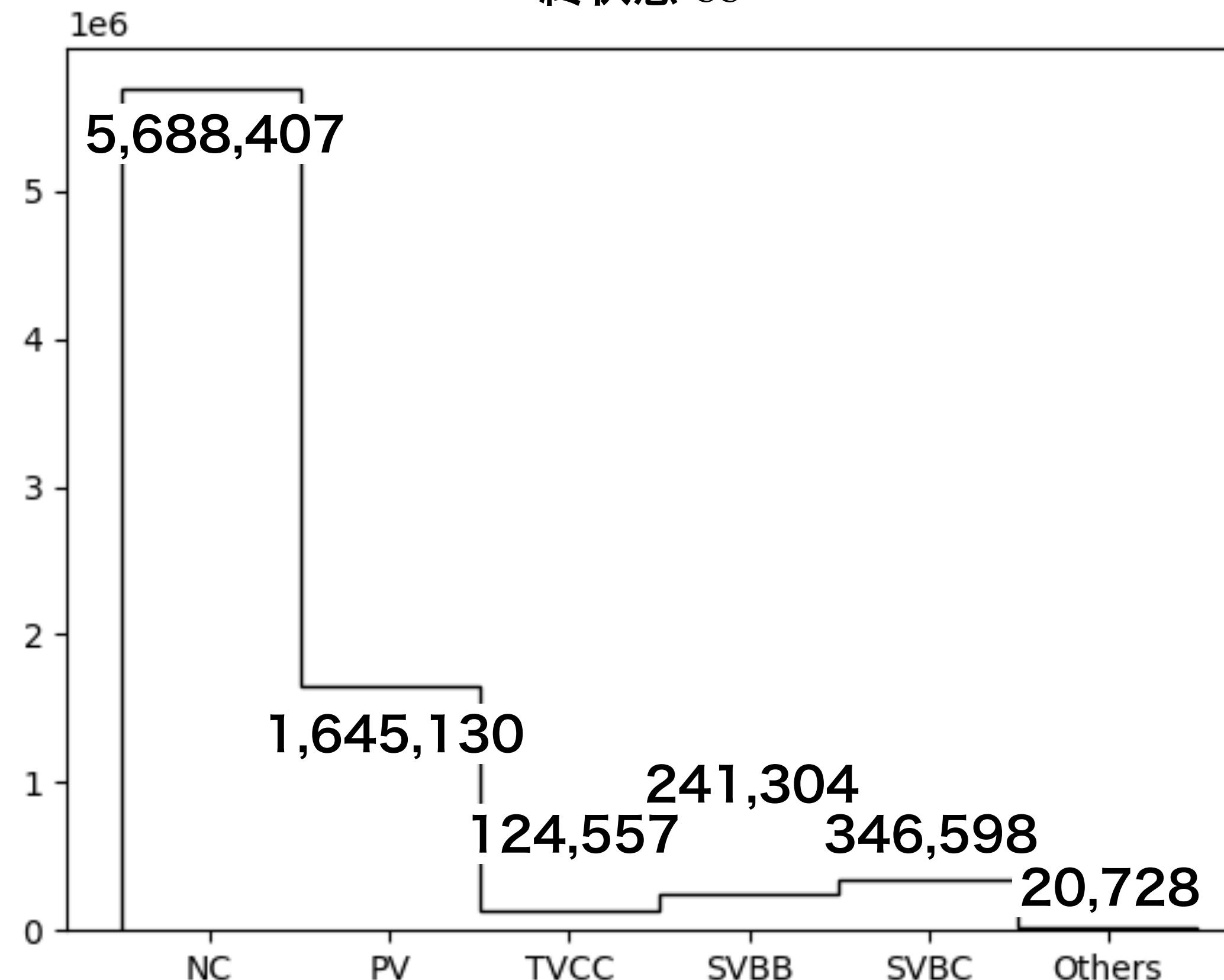
Secondary Vertex BC
(SVBC)



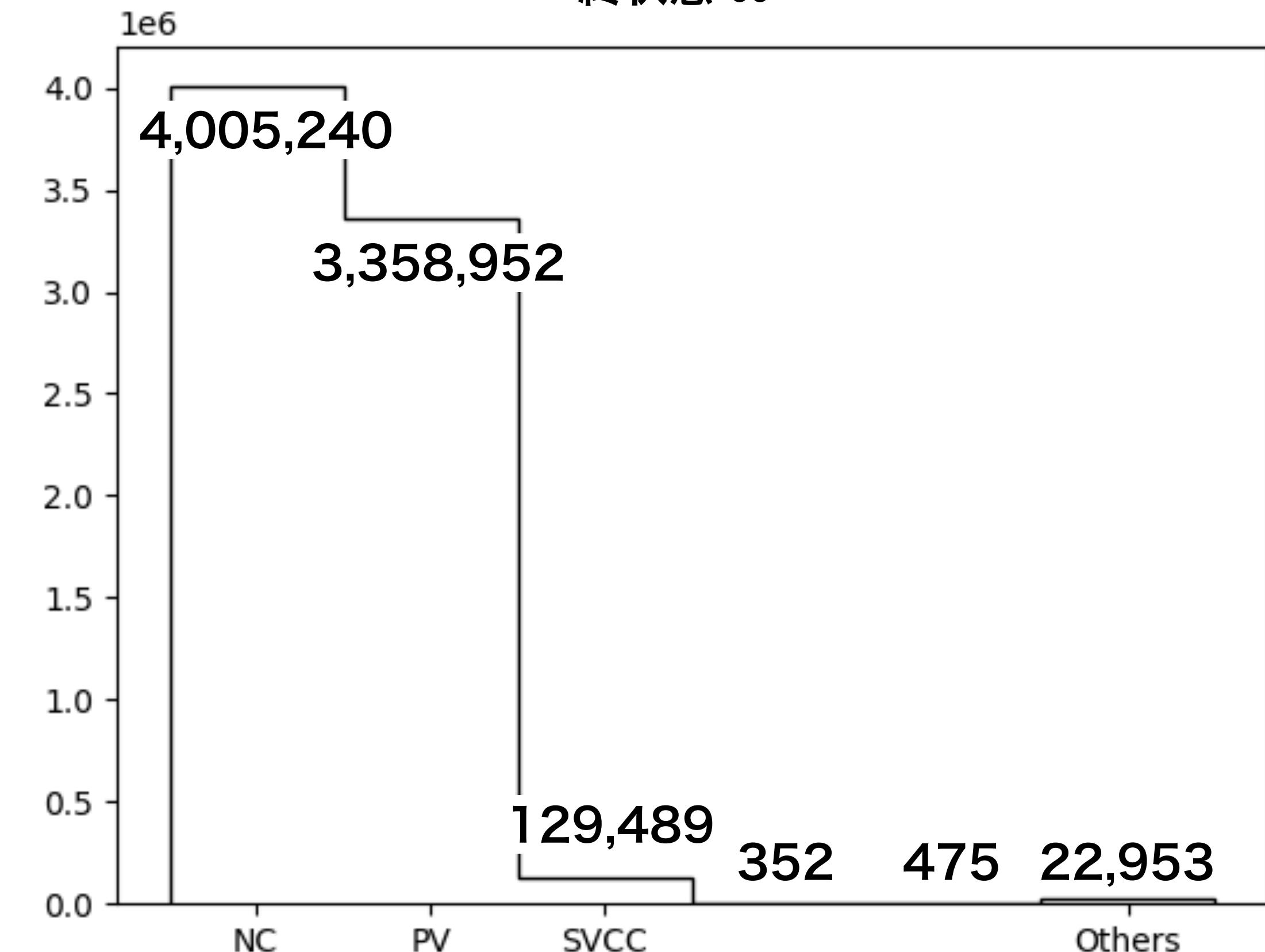
チャーム・フレーバーのハドロンによる
Tertiary Vertex (TBCC)

ボトム・フレーバーのハドロンによる
Secondary Vertex (SVBB)

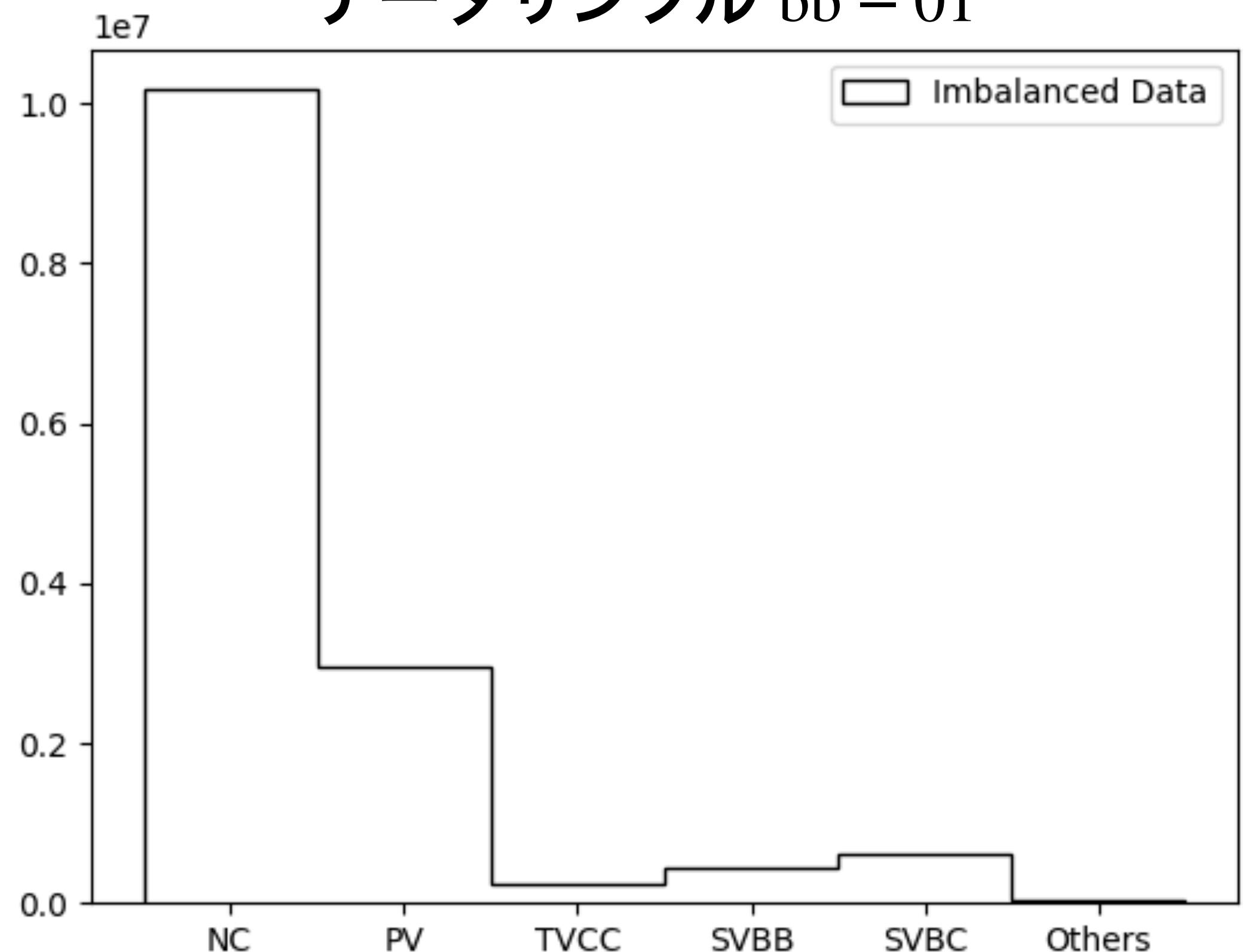
終状態 $b\bar{b}$



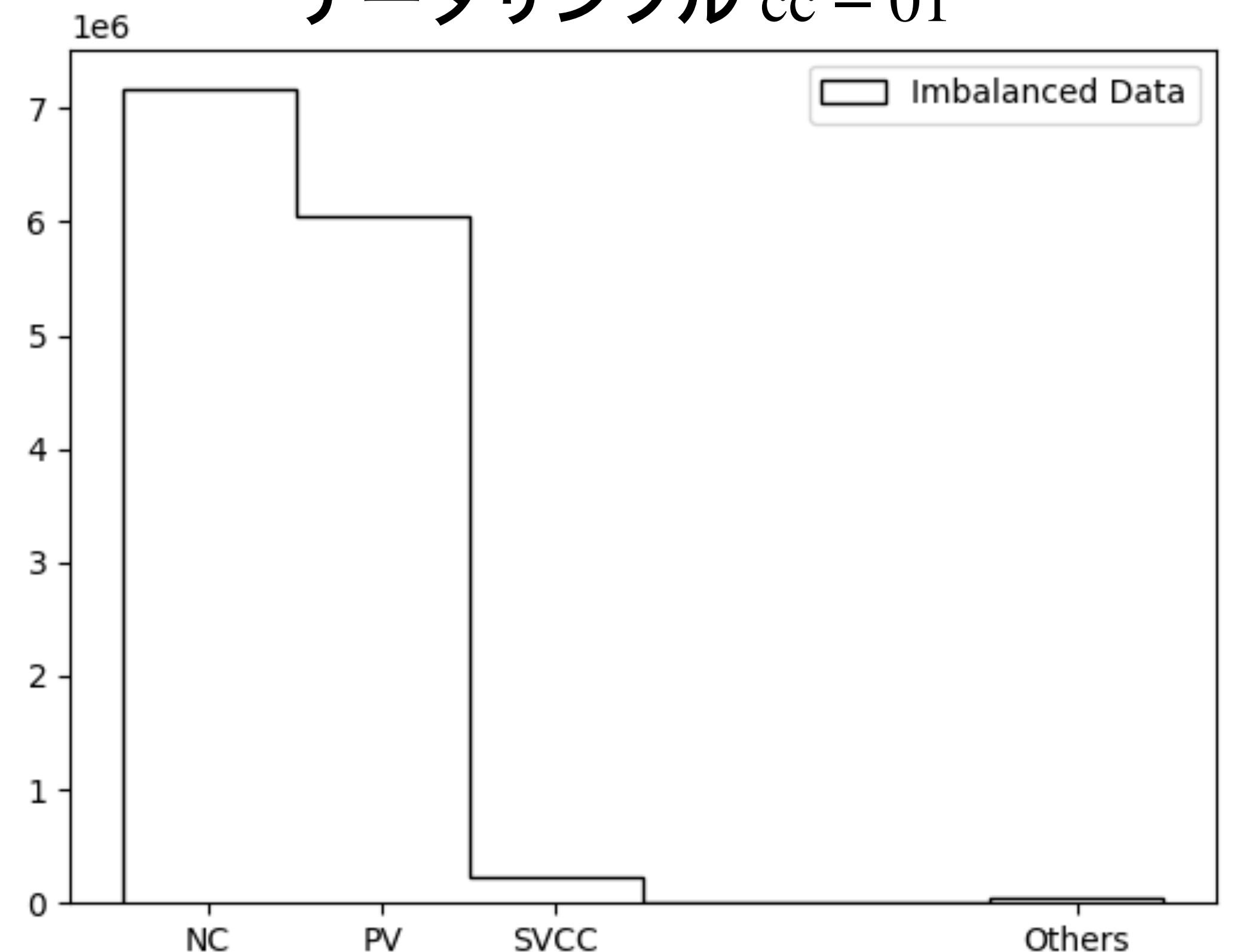
終状態 $c\bar{c}$



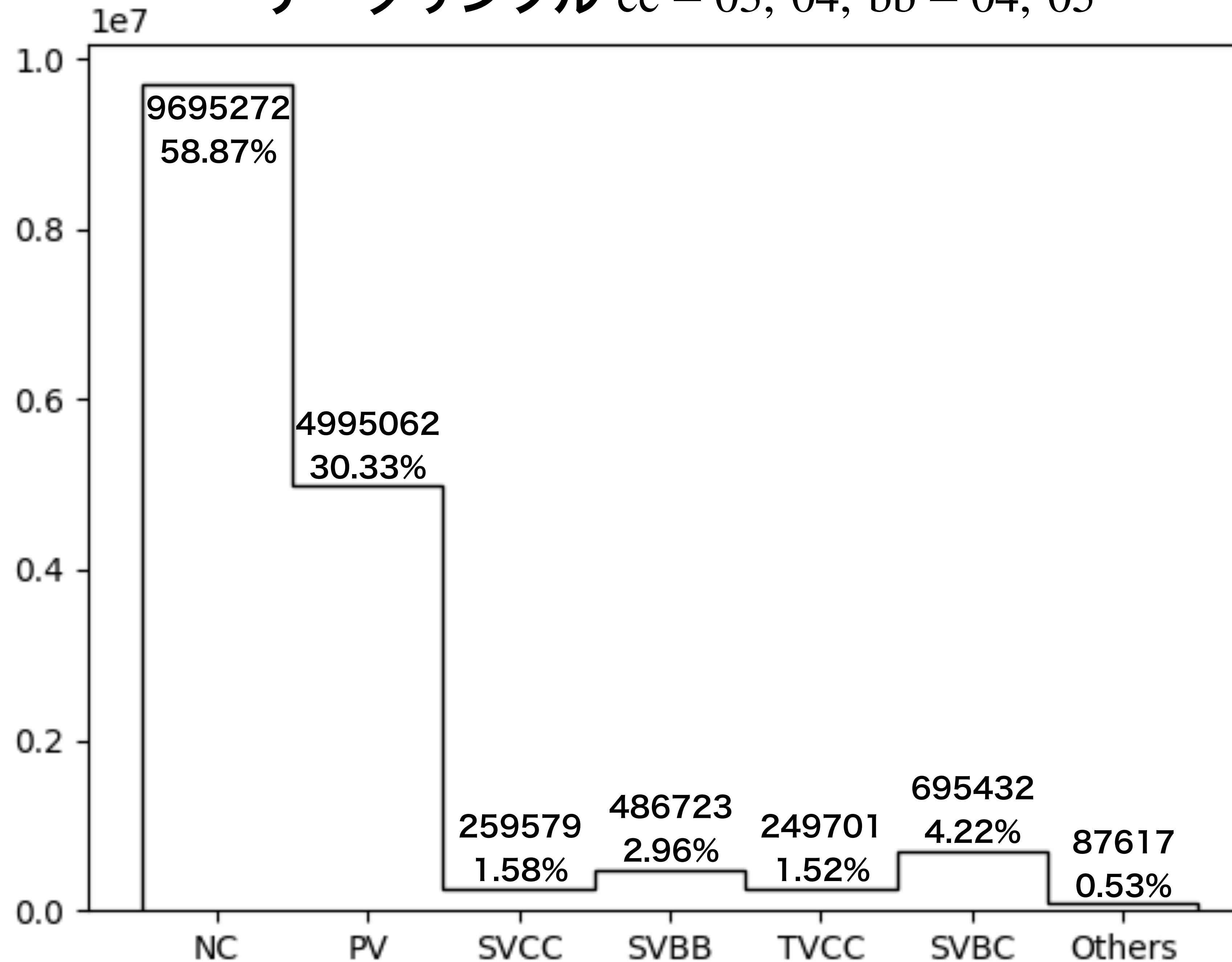
データサンプル $b\bar{b}$ – 01

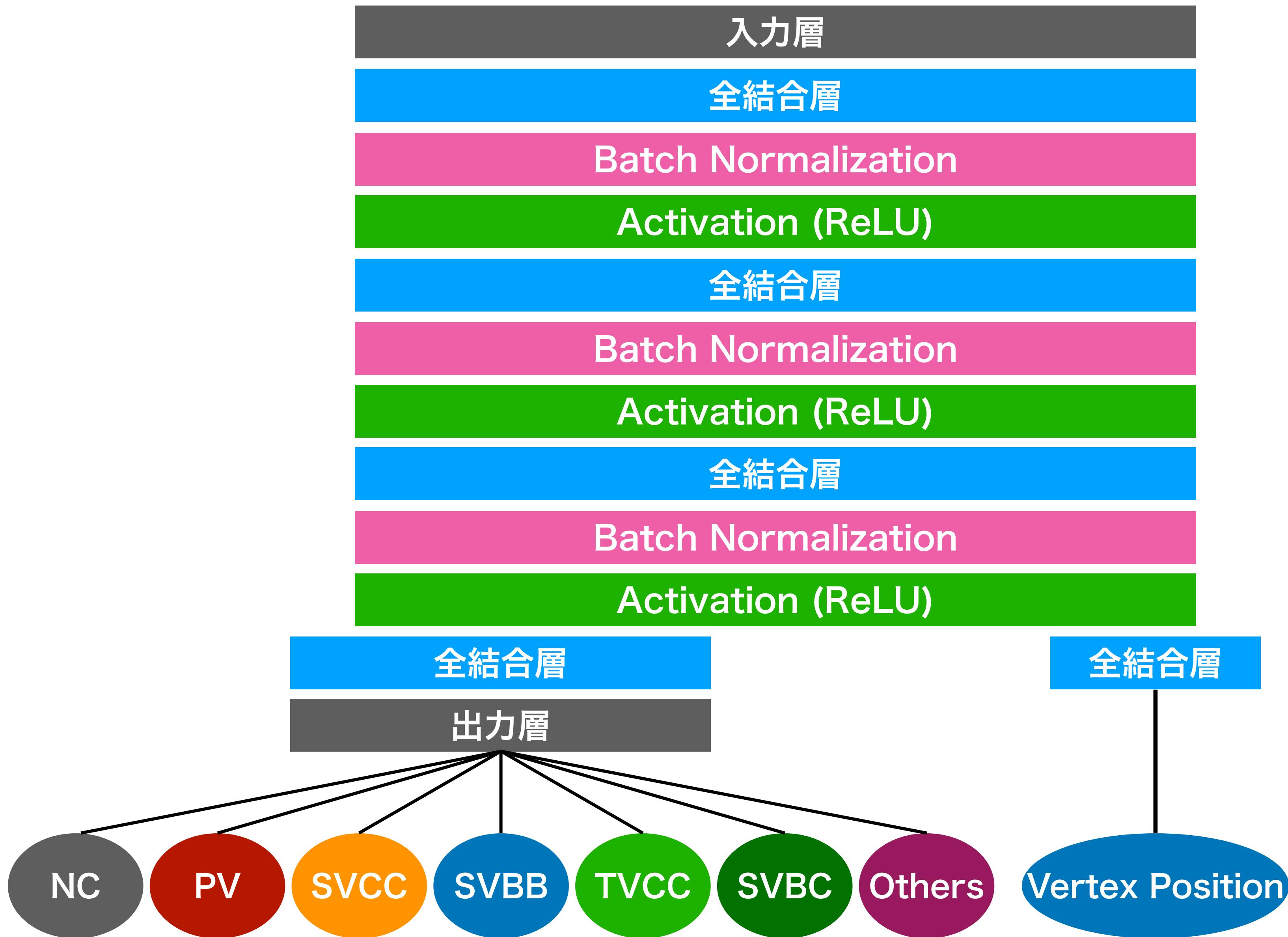


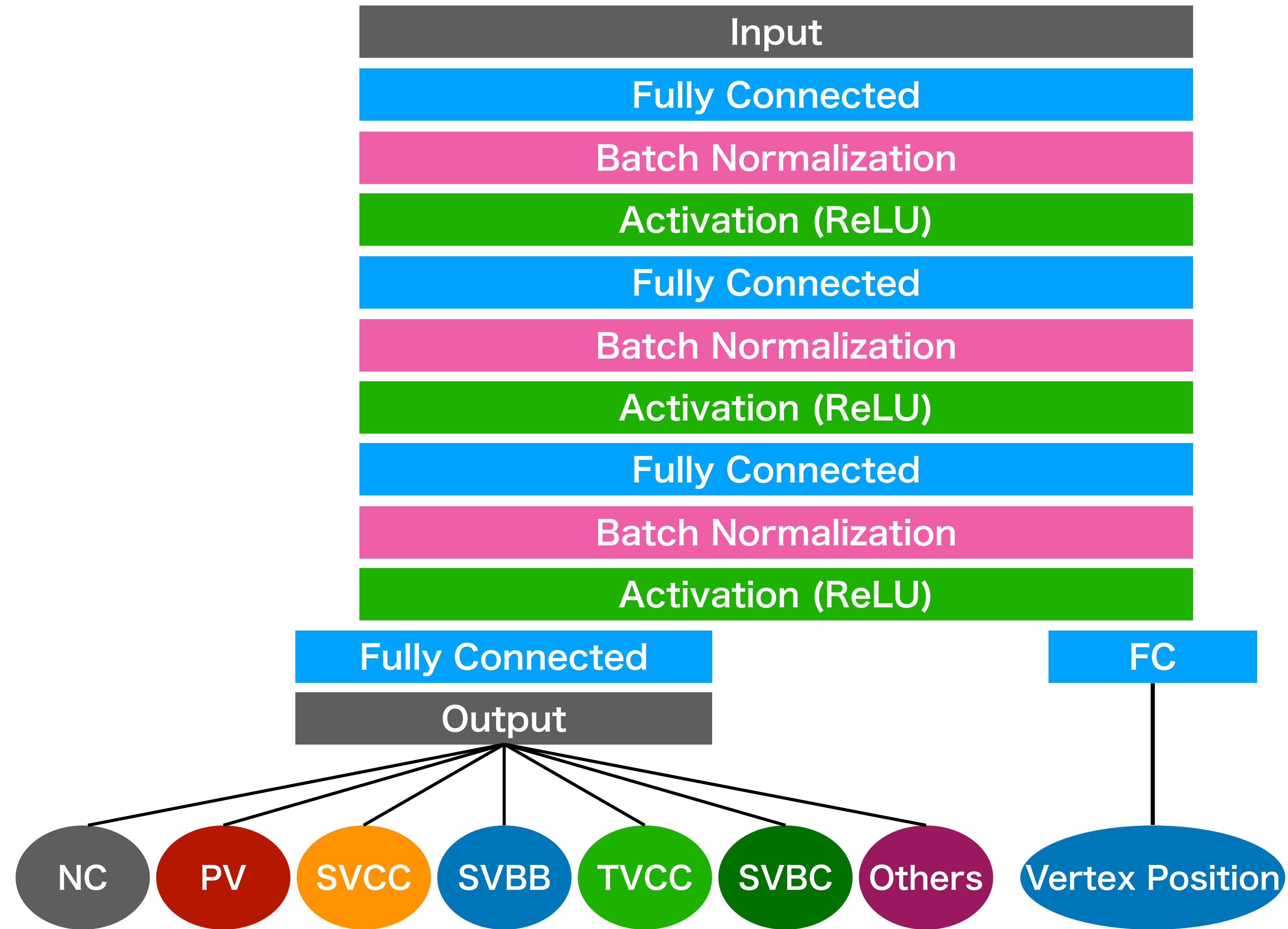
データサンプル $c\bar{c}$ – 01

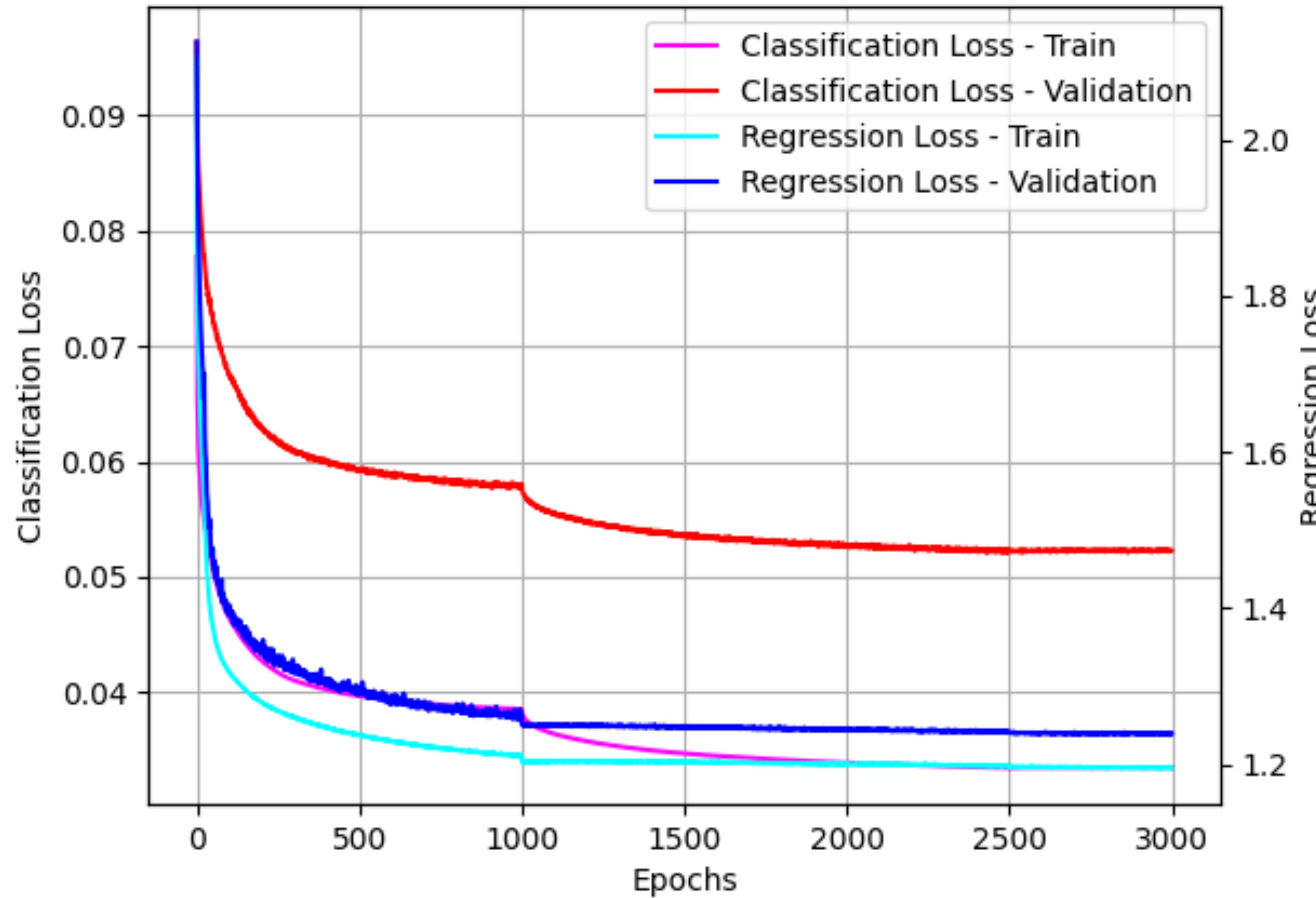


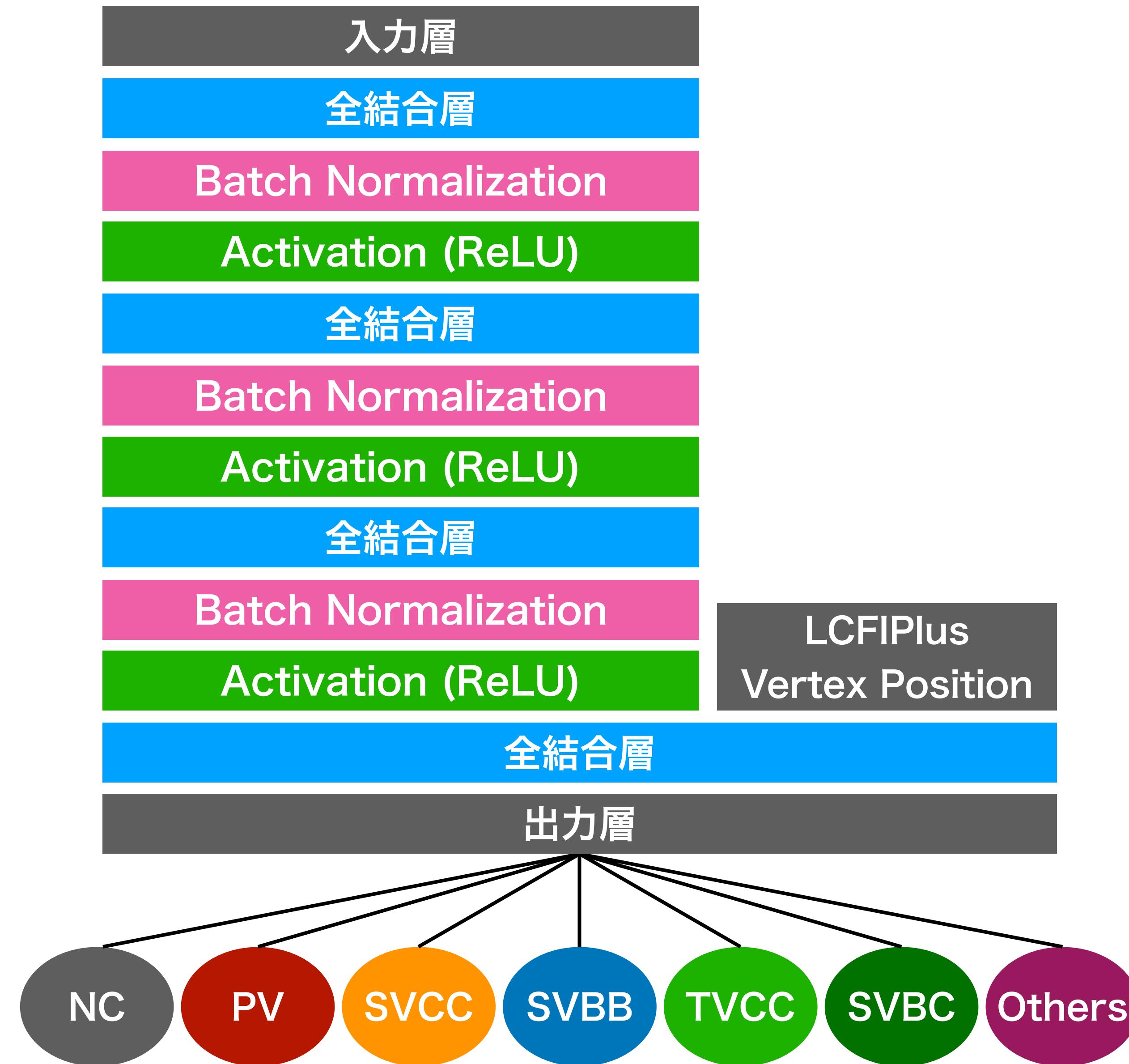
データサンプル $c\bar{c}$ – 03, 04, $b\bar{b}$ – 04, 05

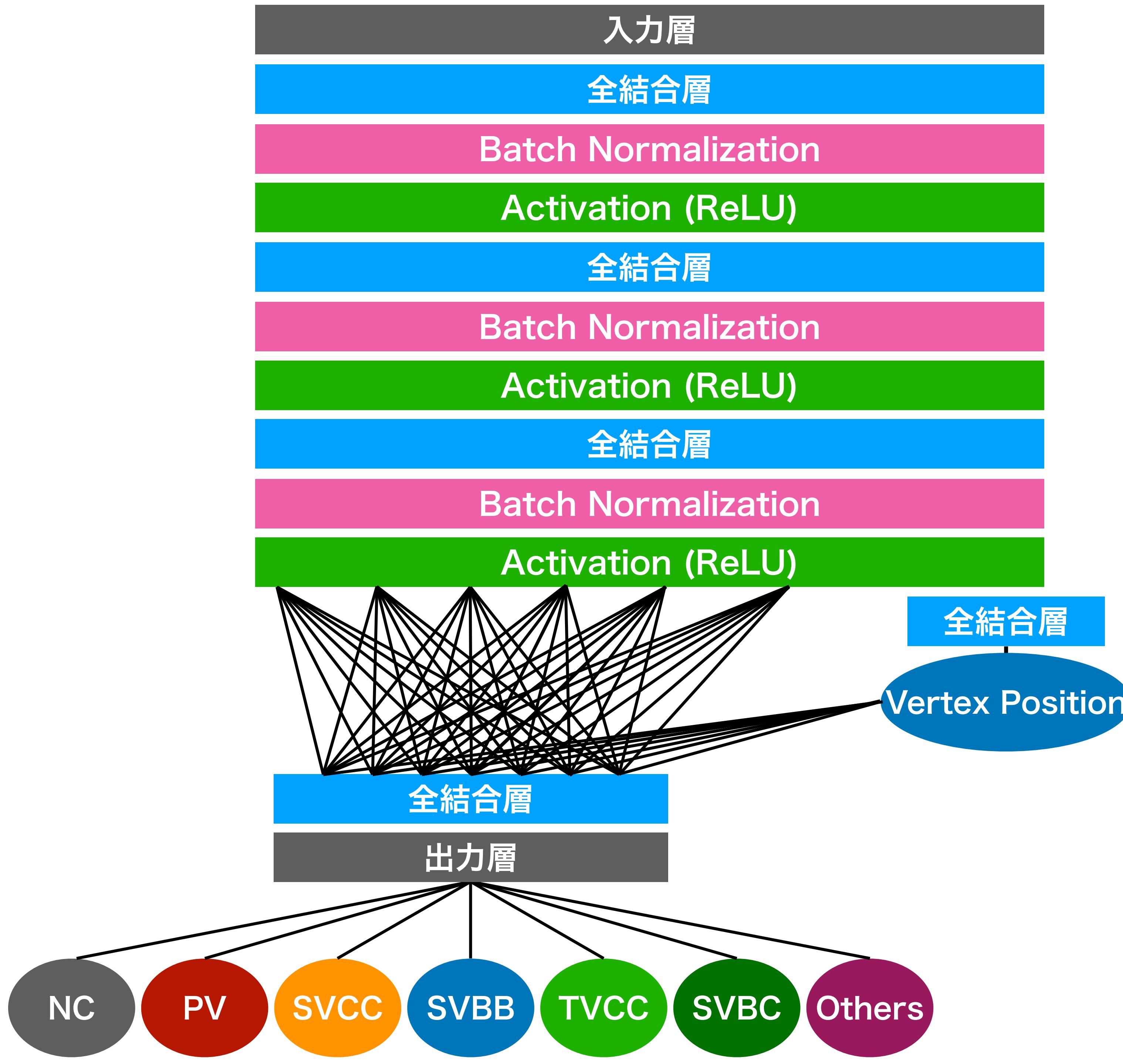


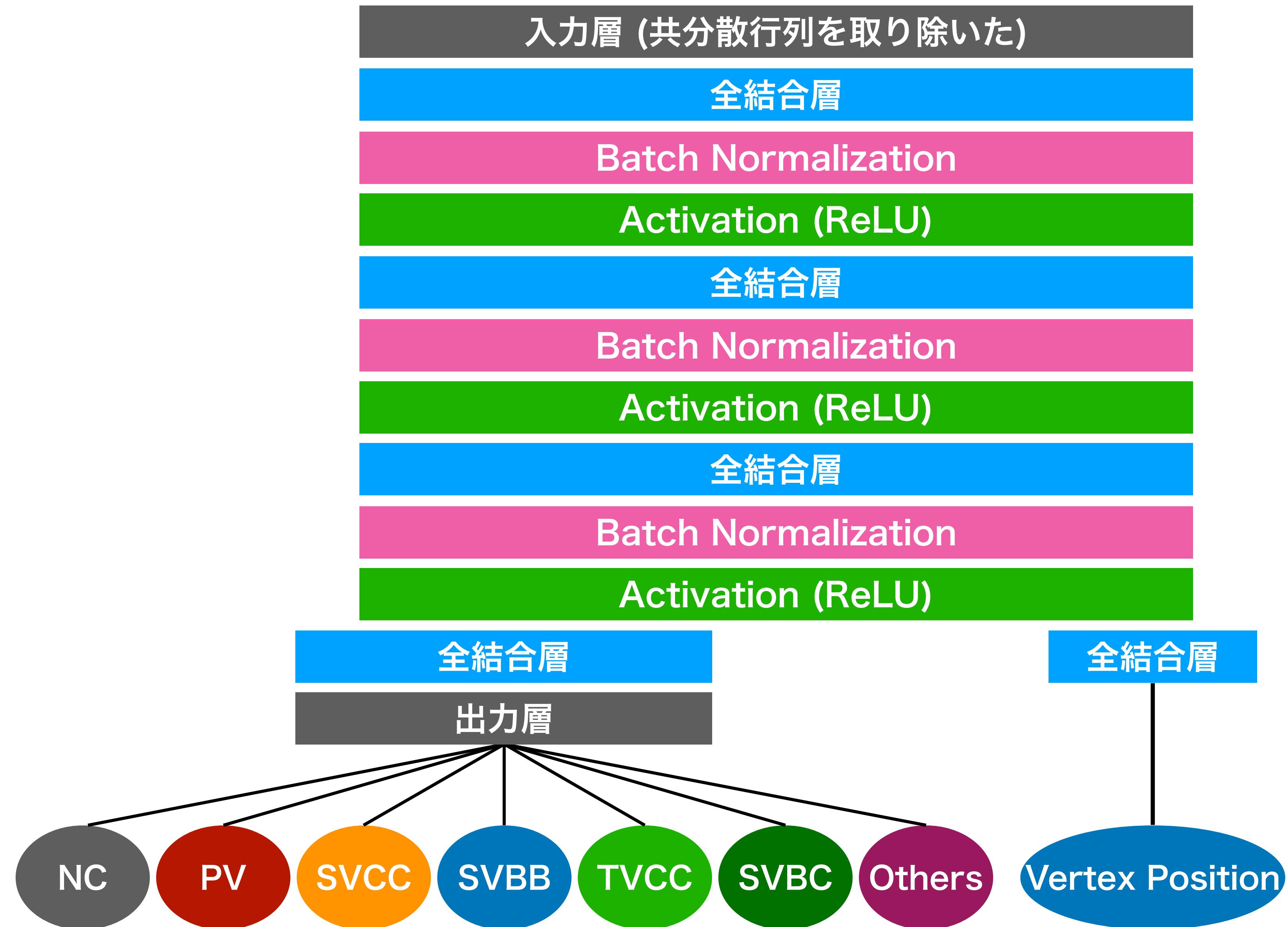


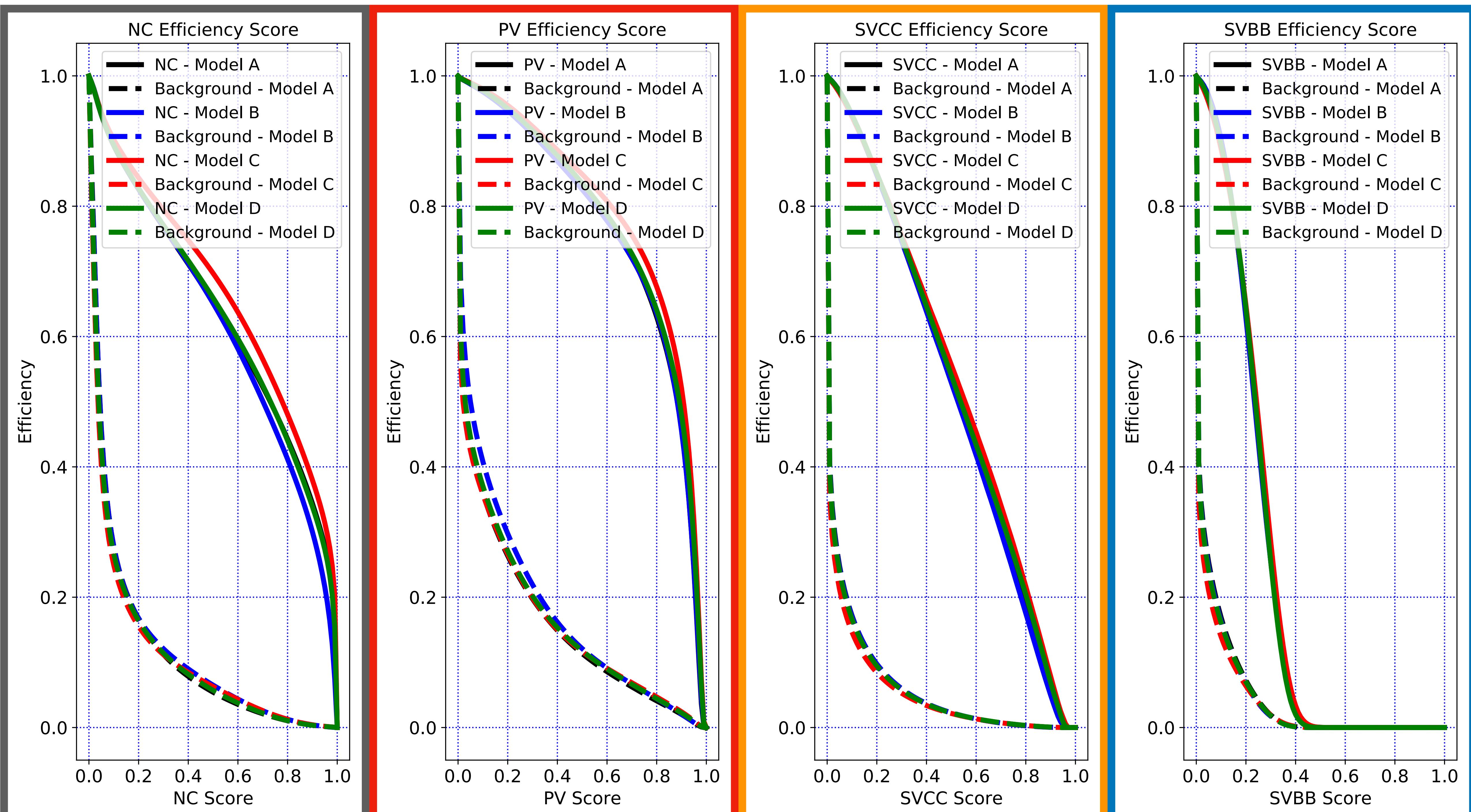


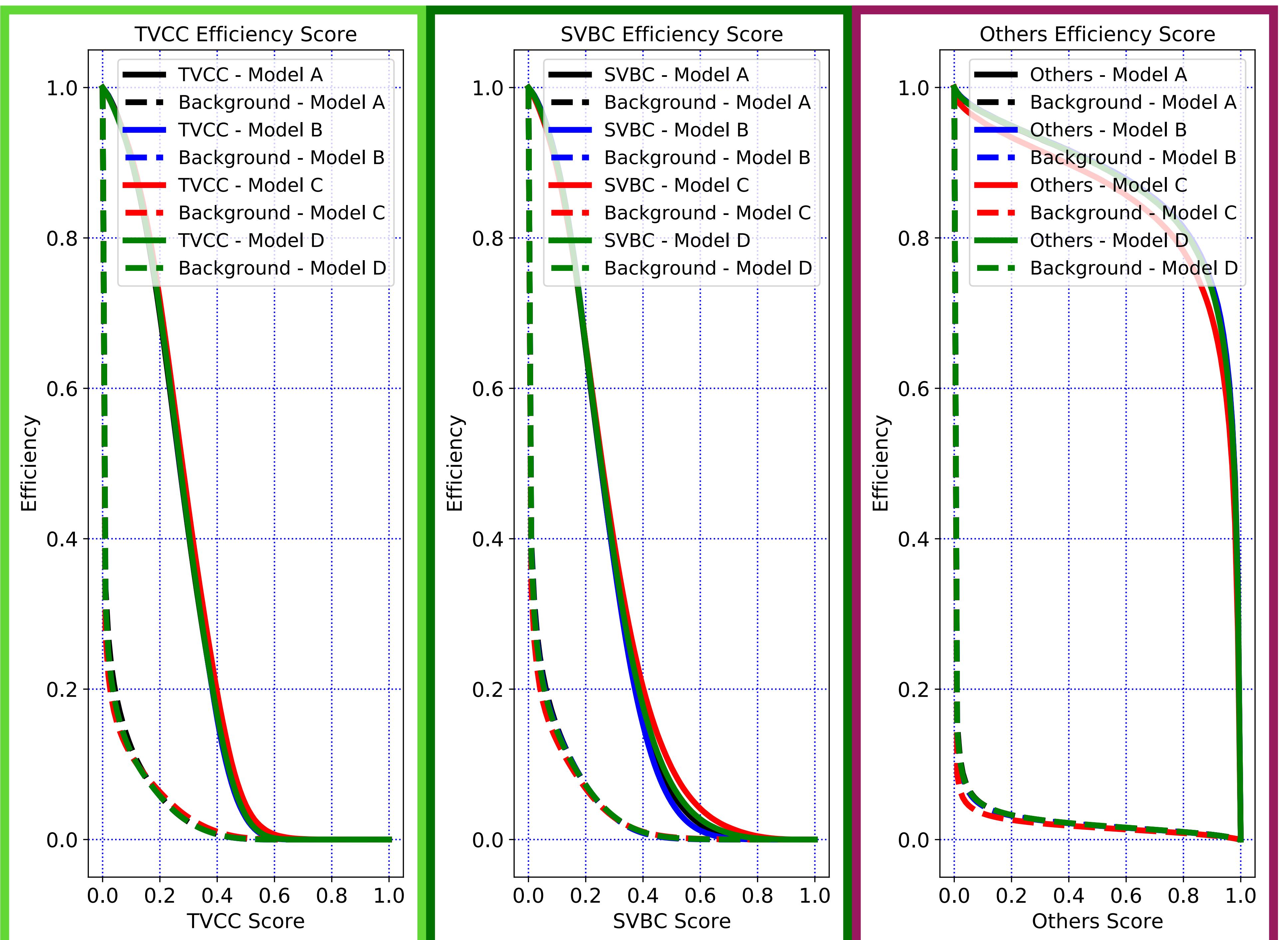


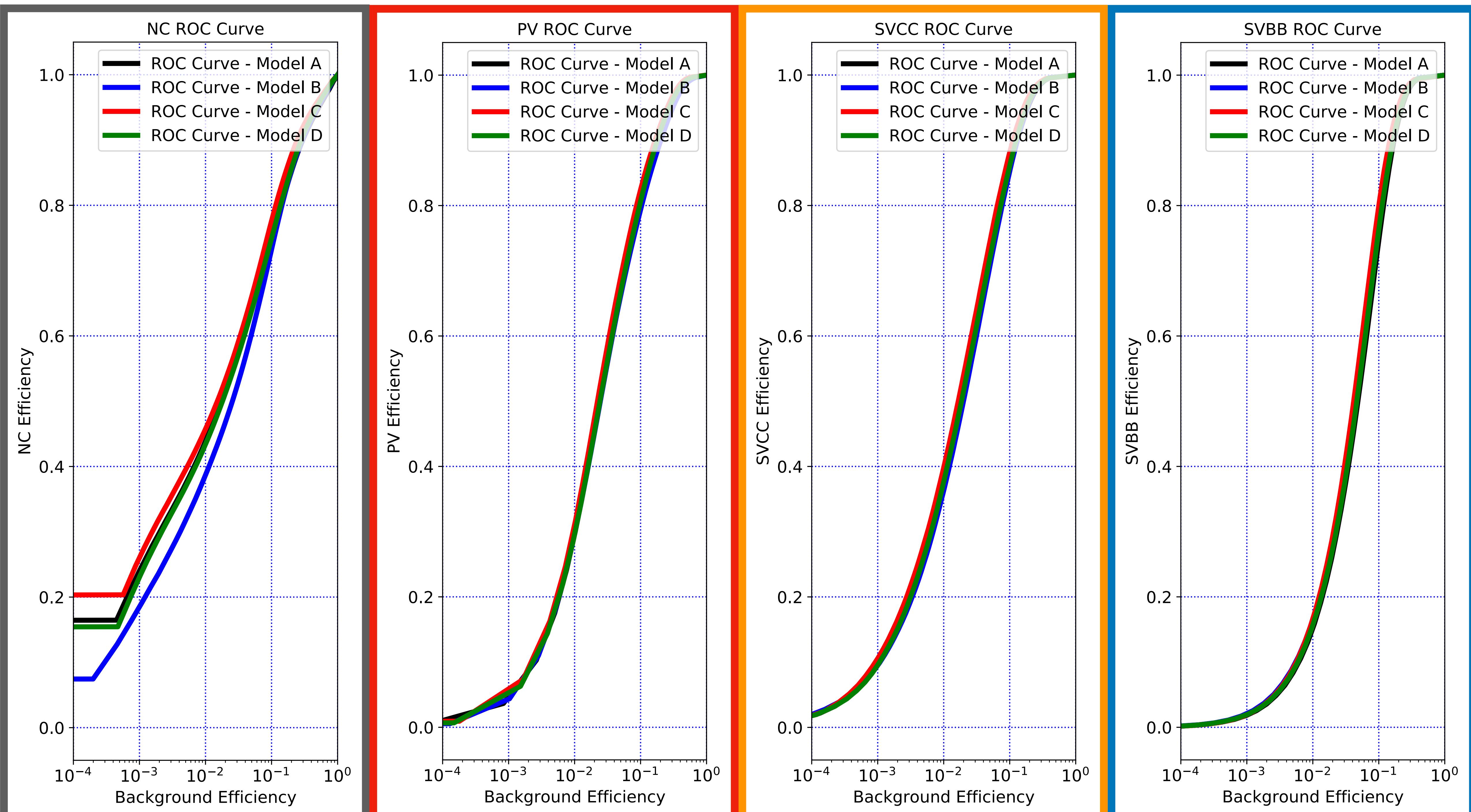


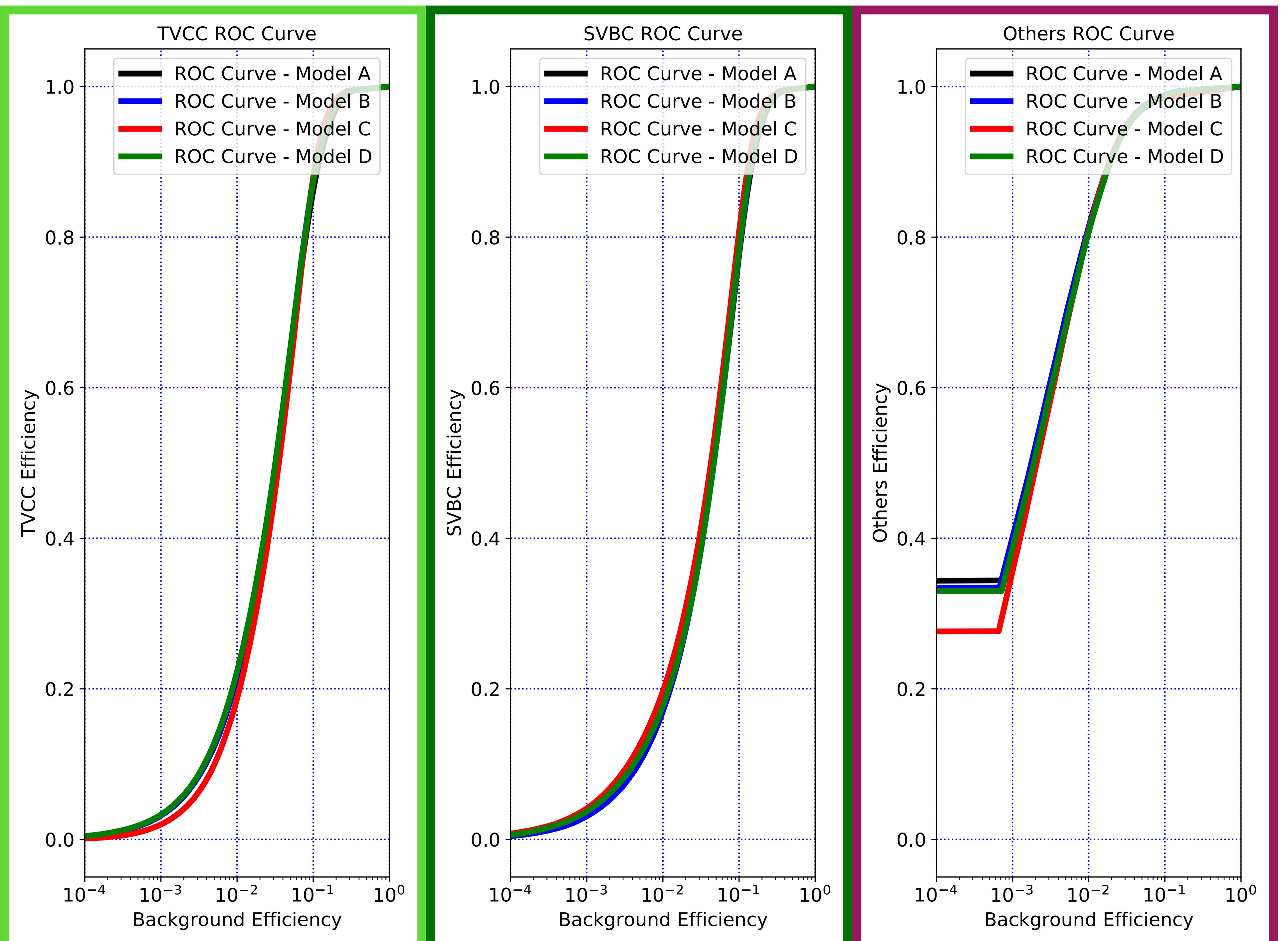


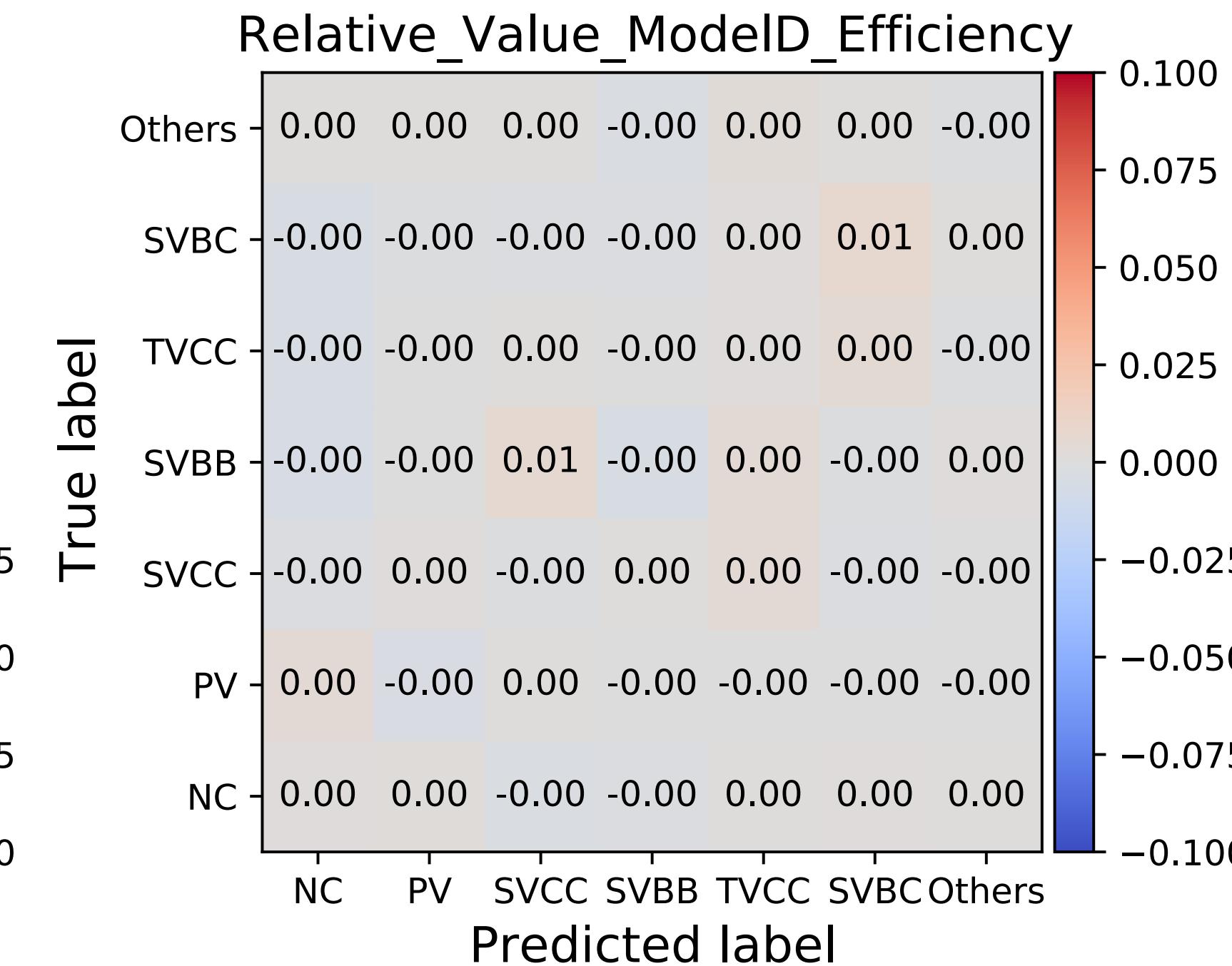
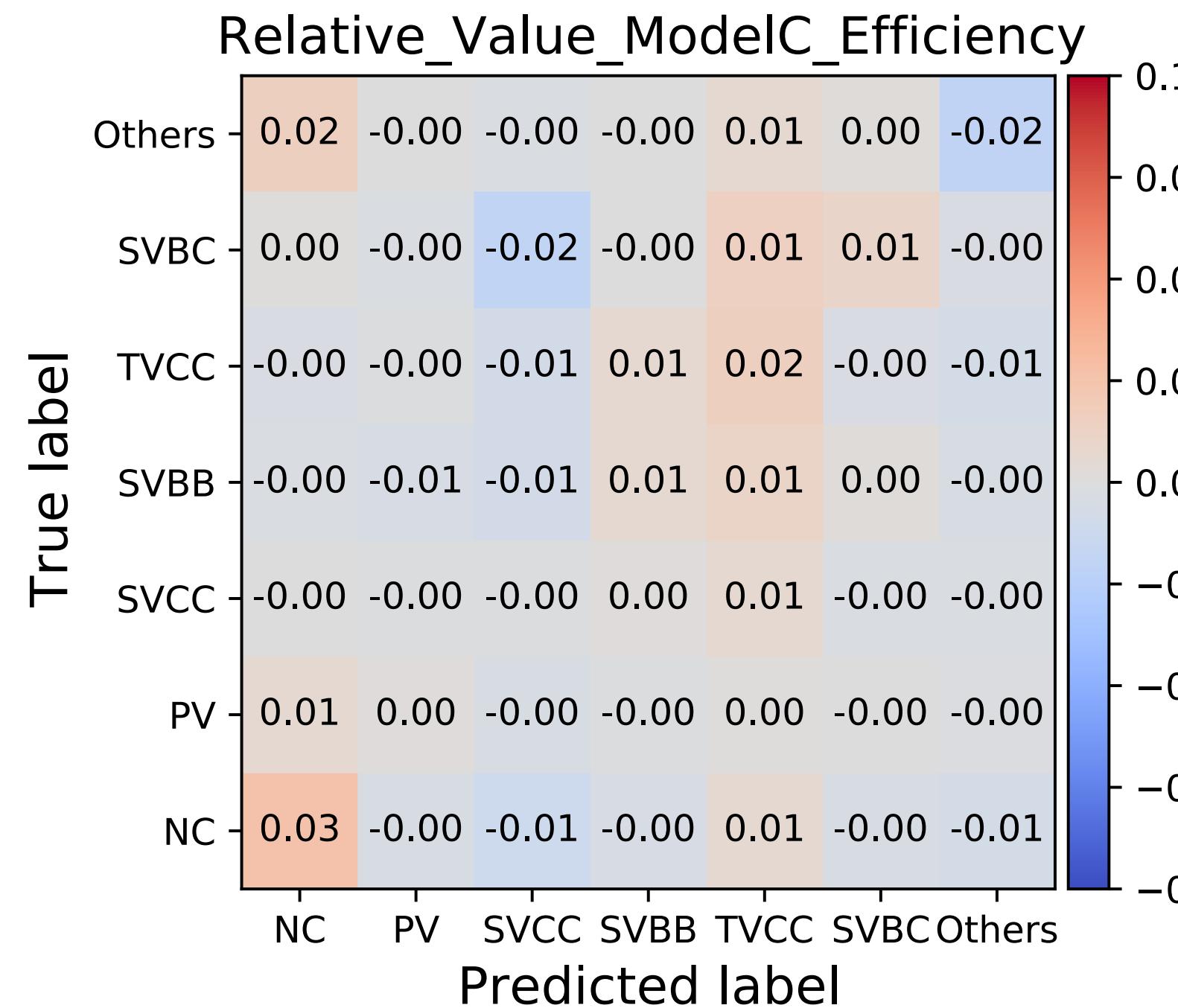
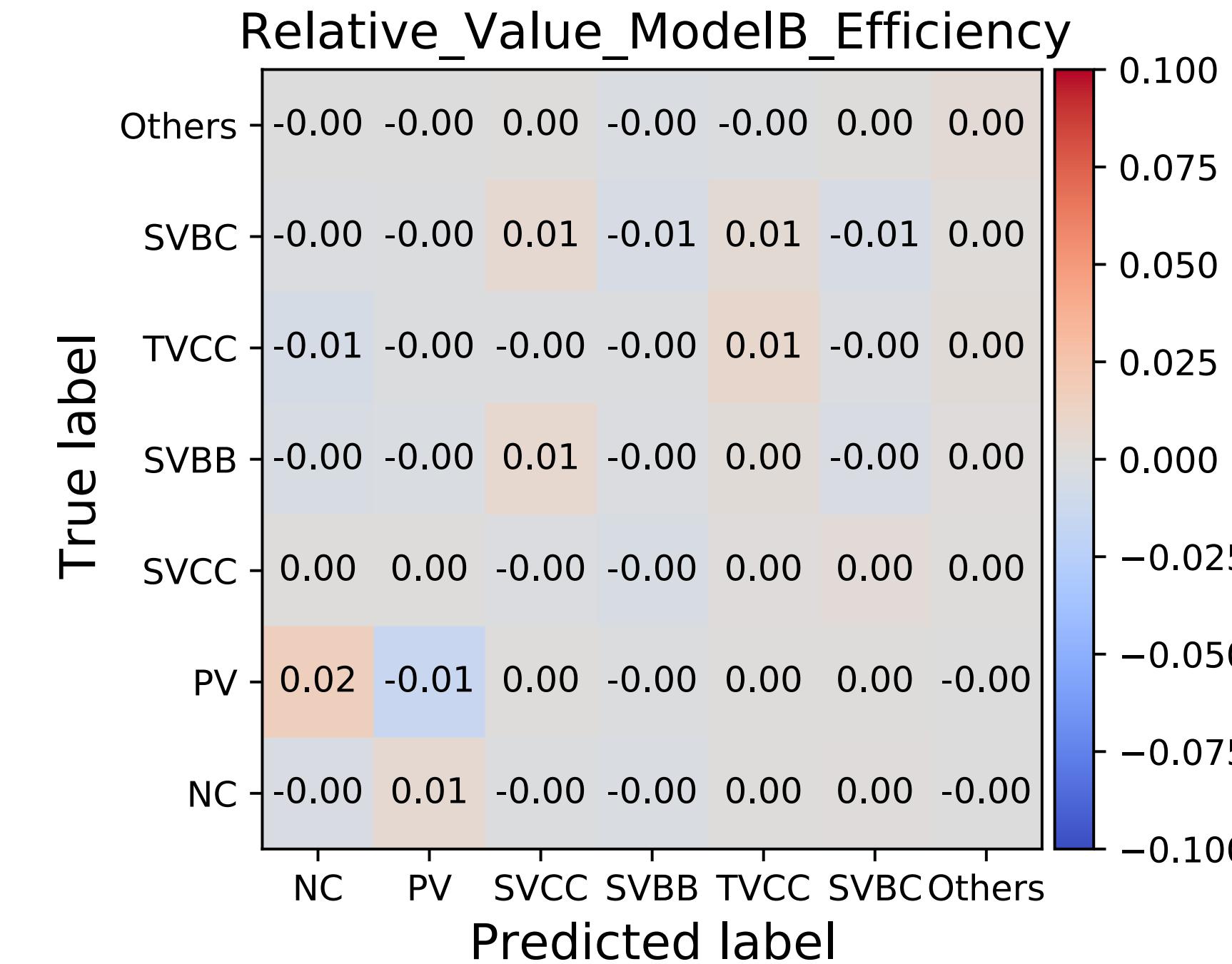
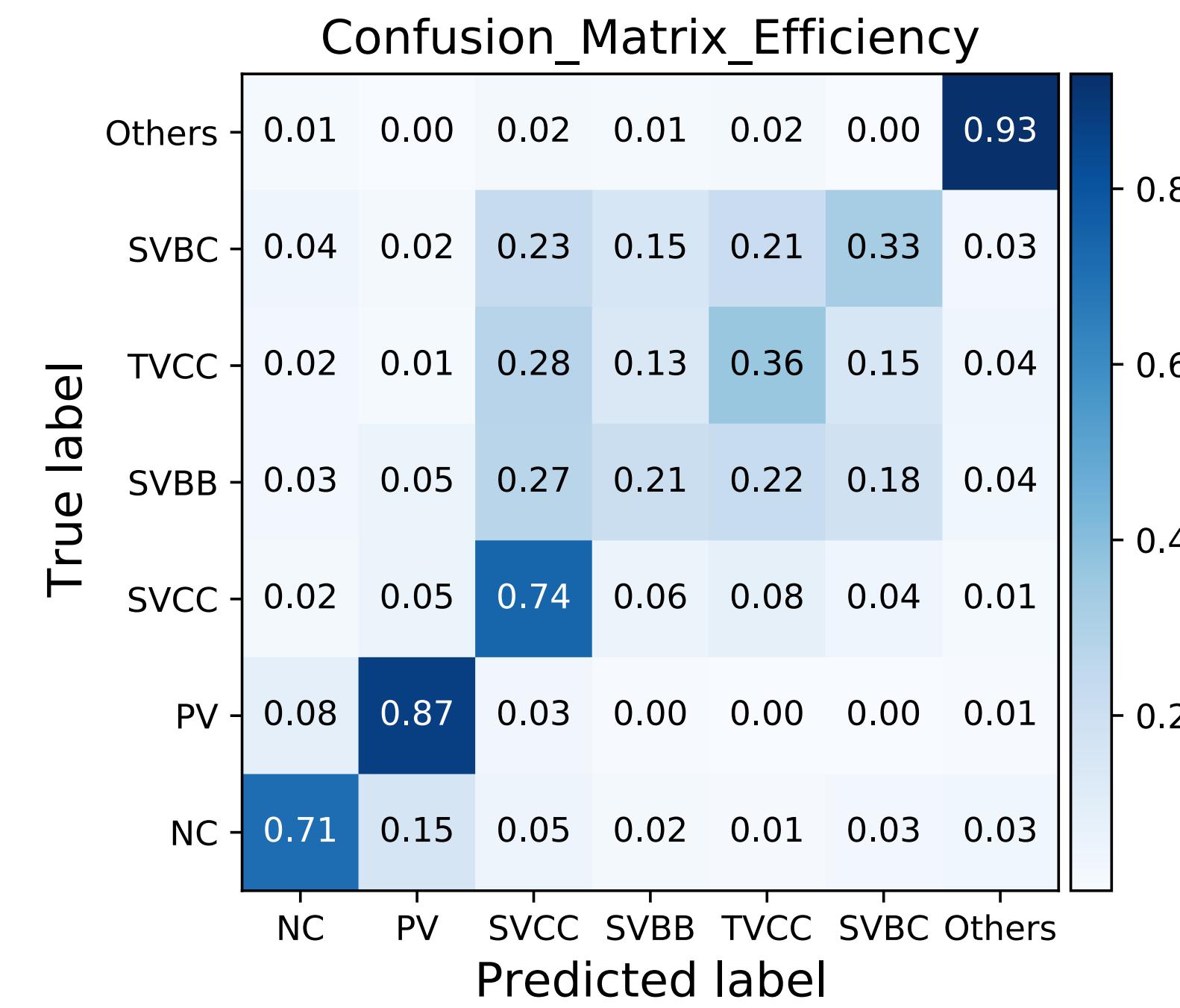


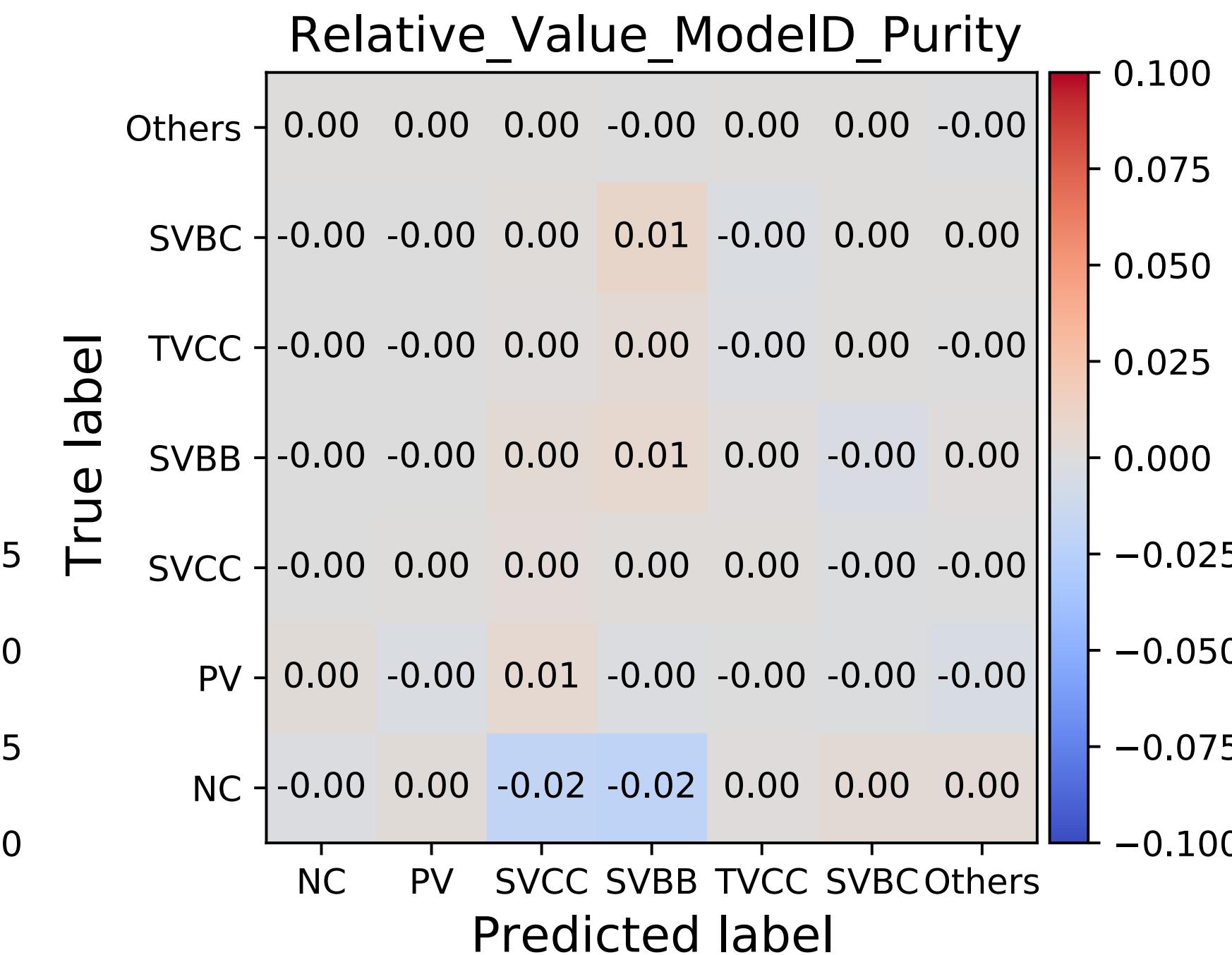
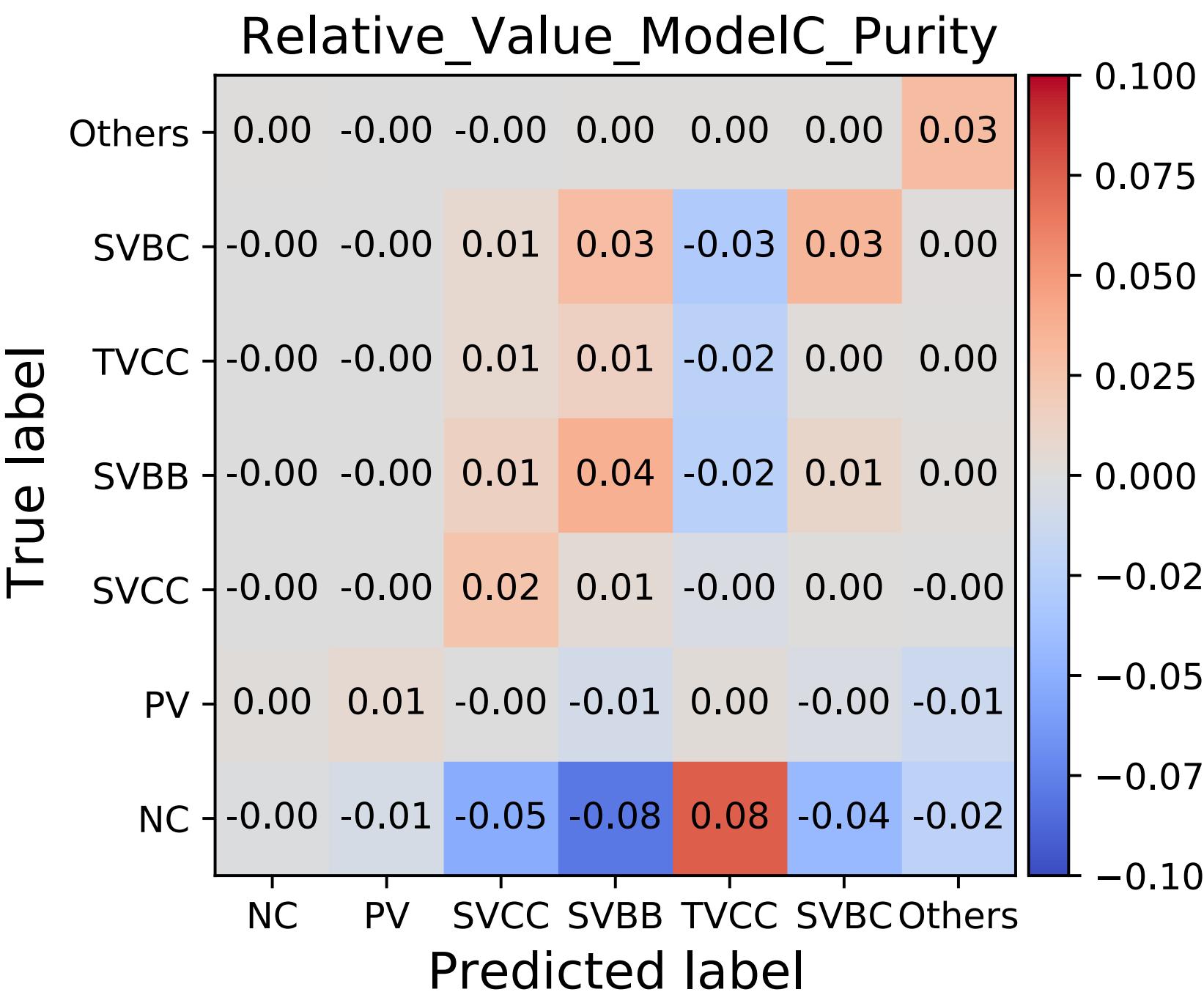
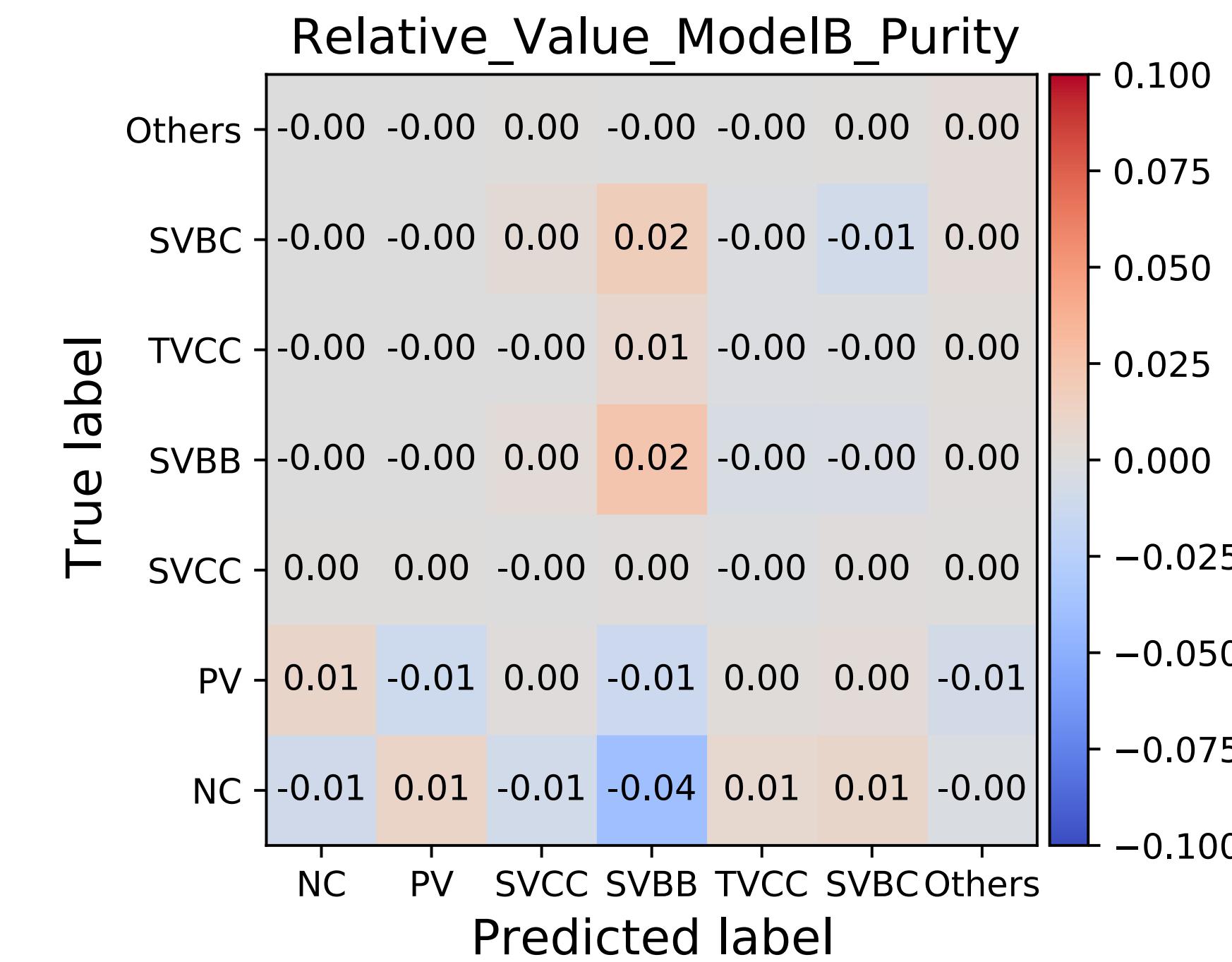
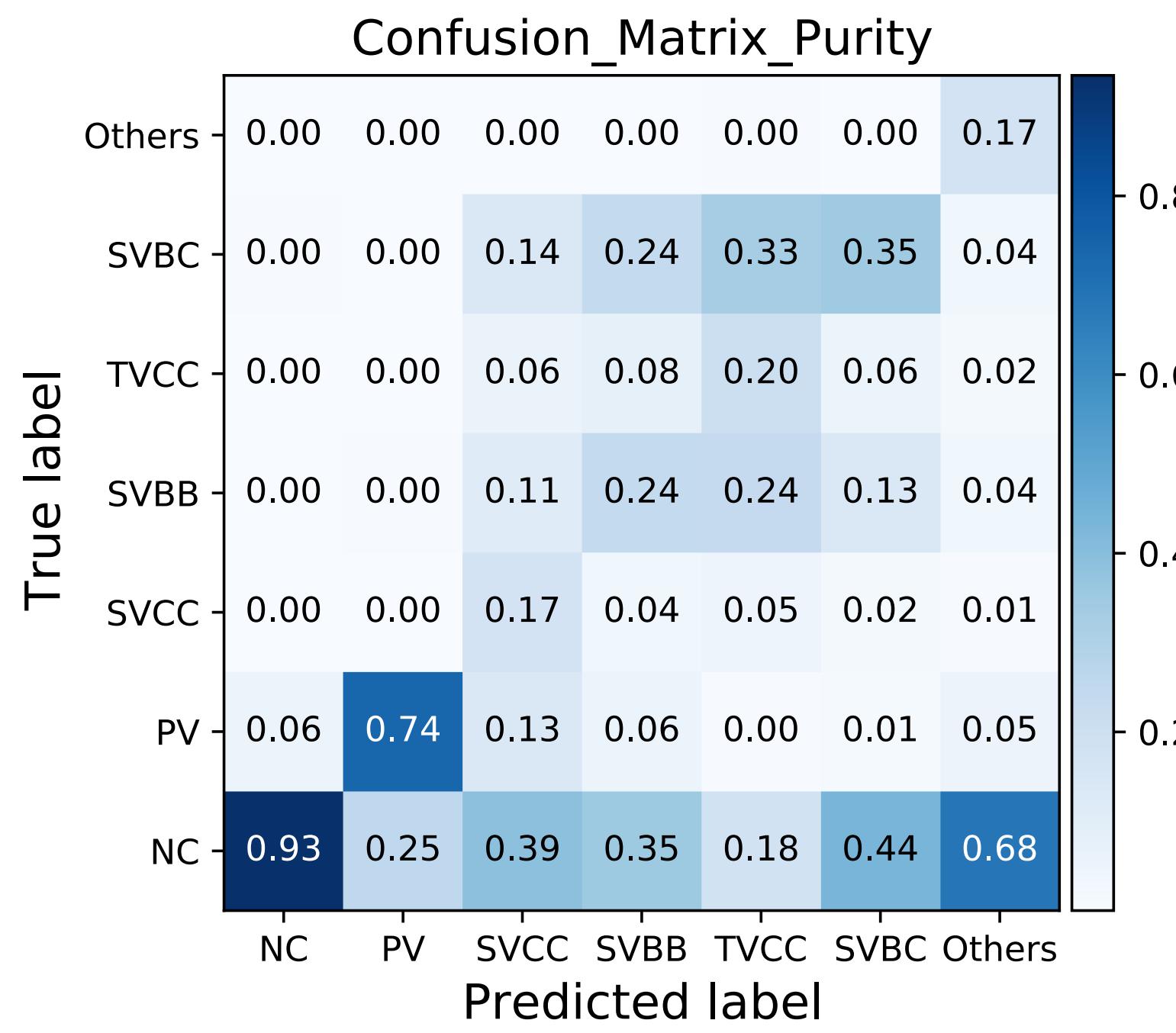




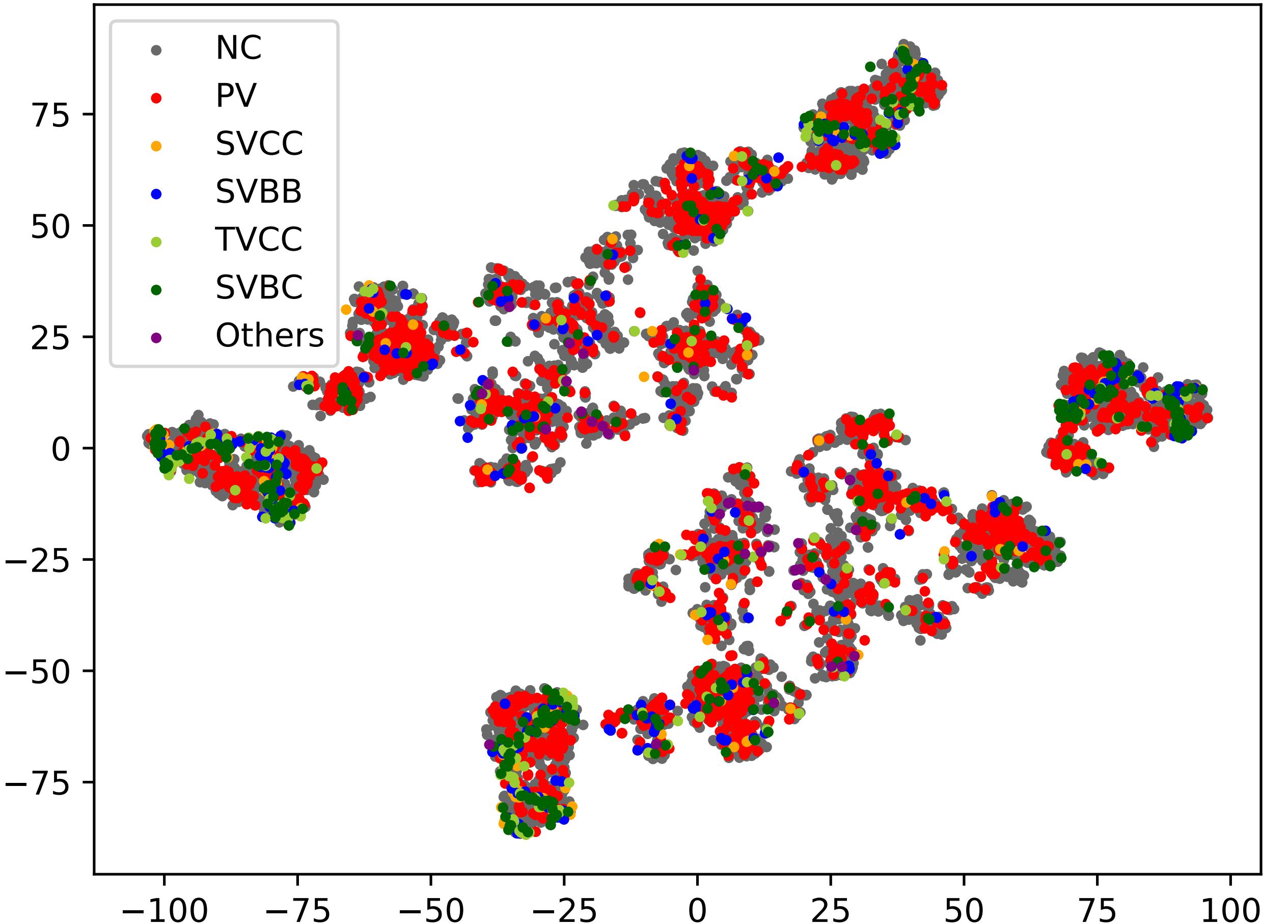




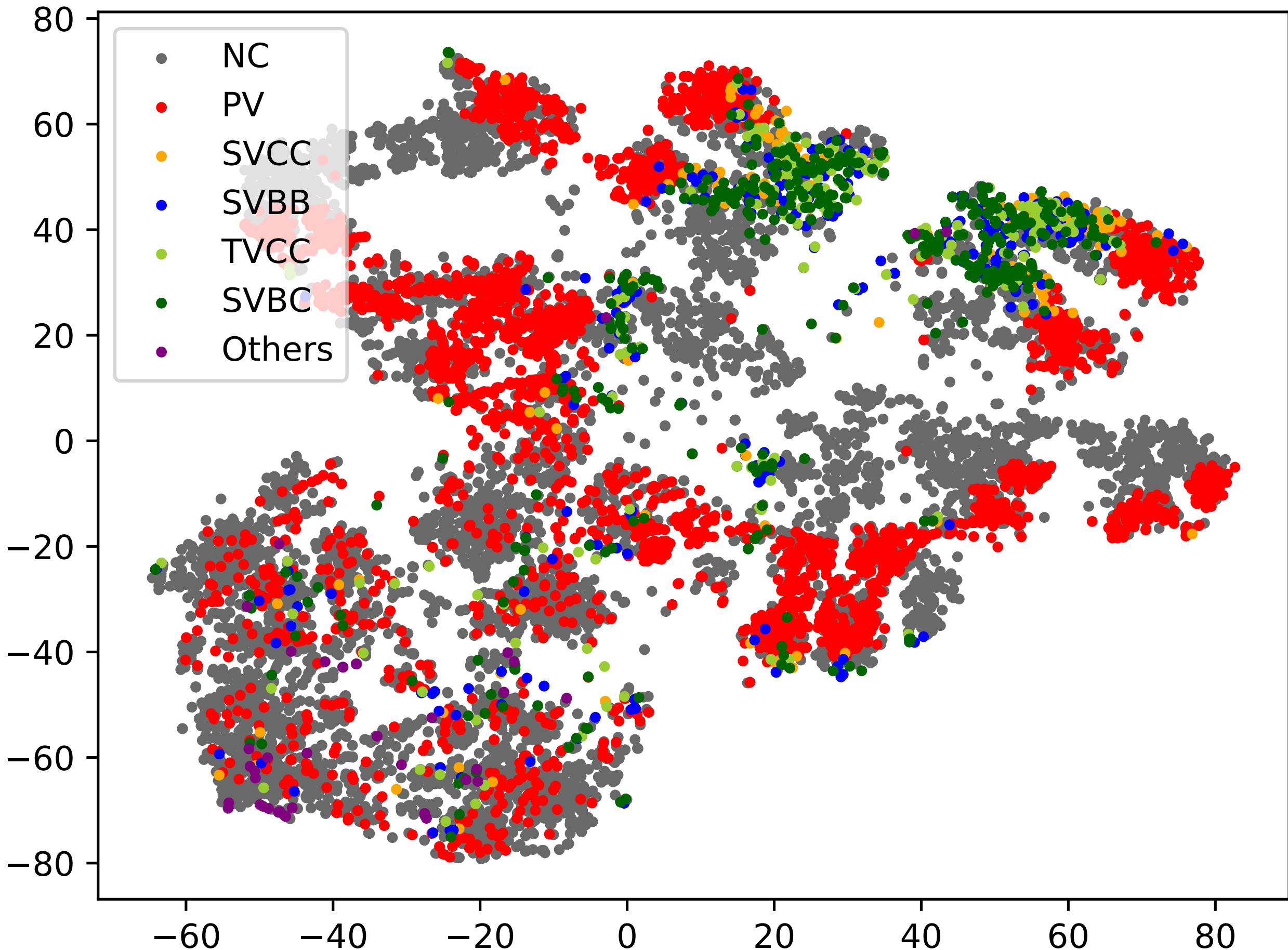


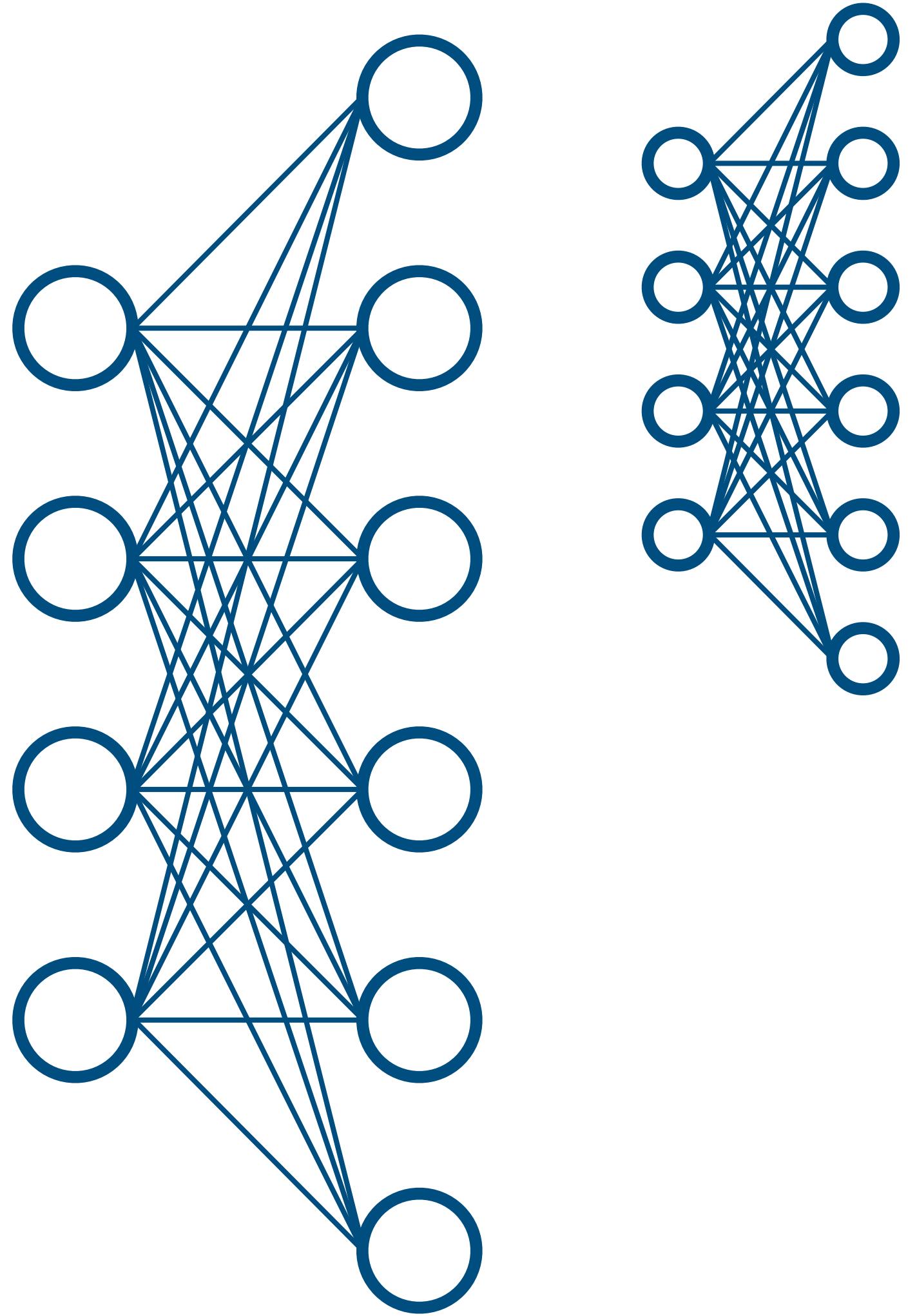


入力変数

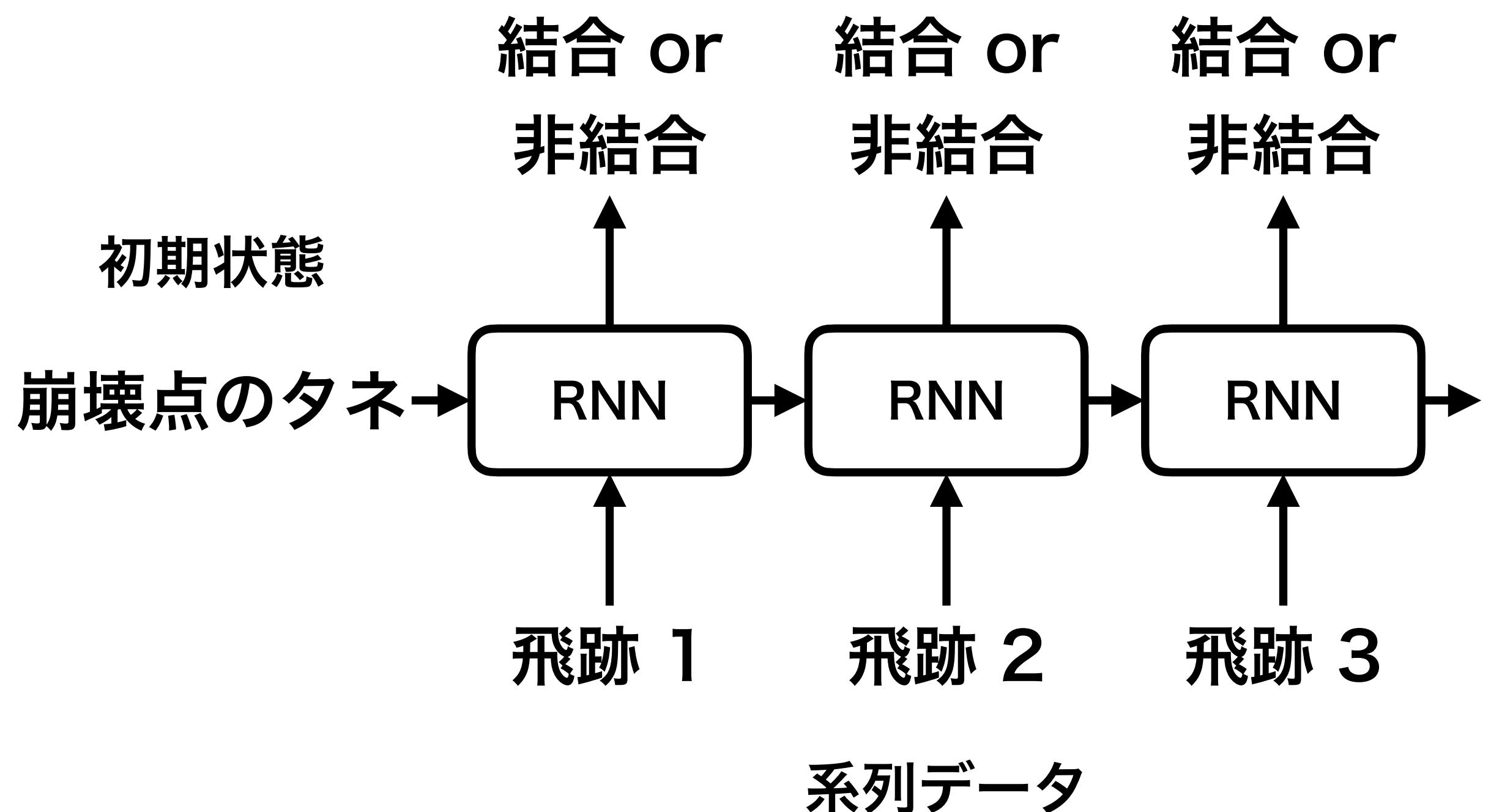


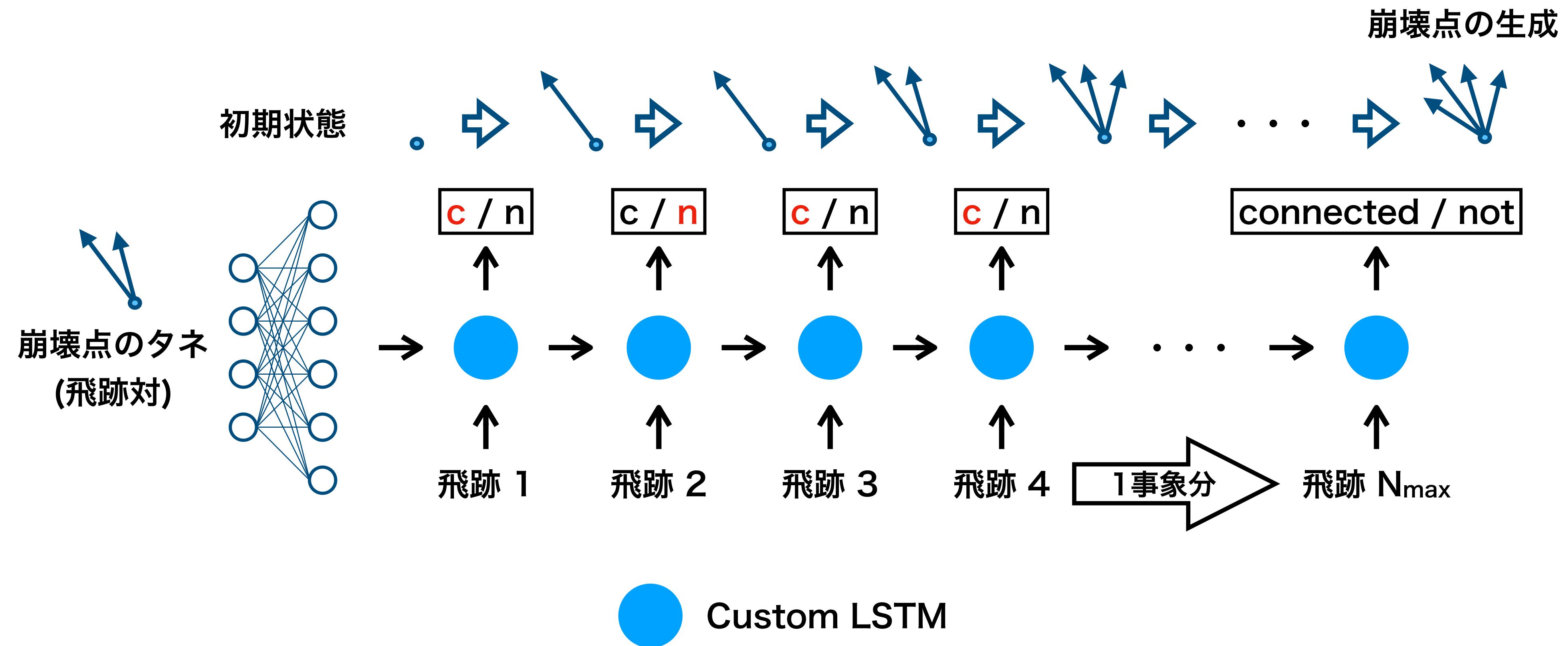
出力の直前の全結合層

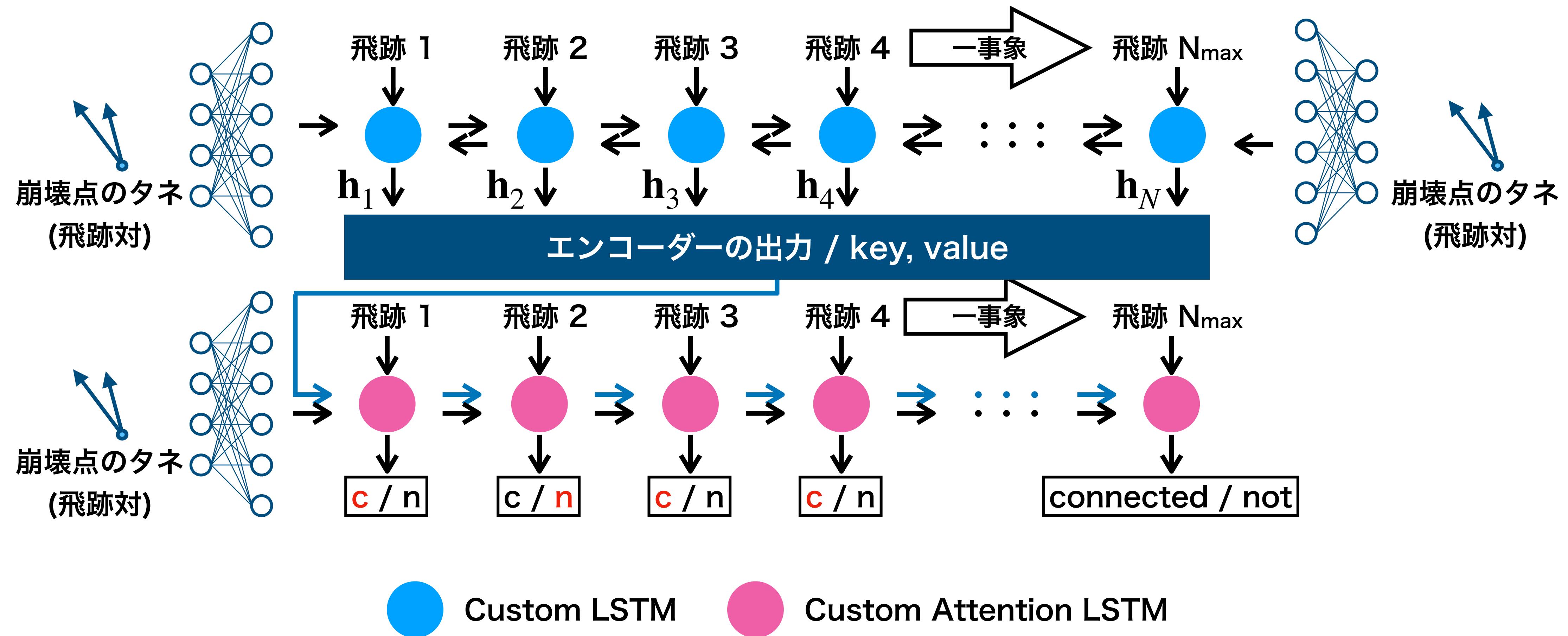




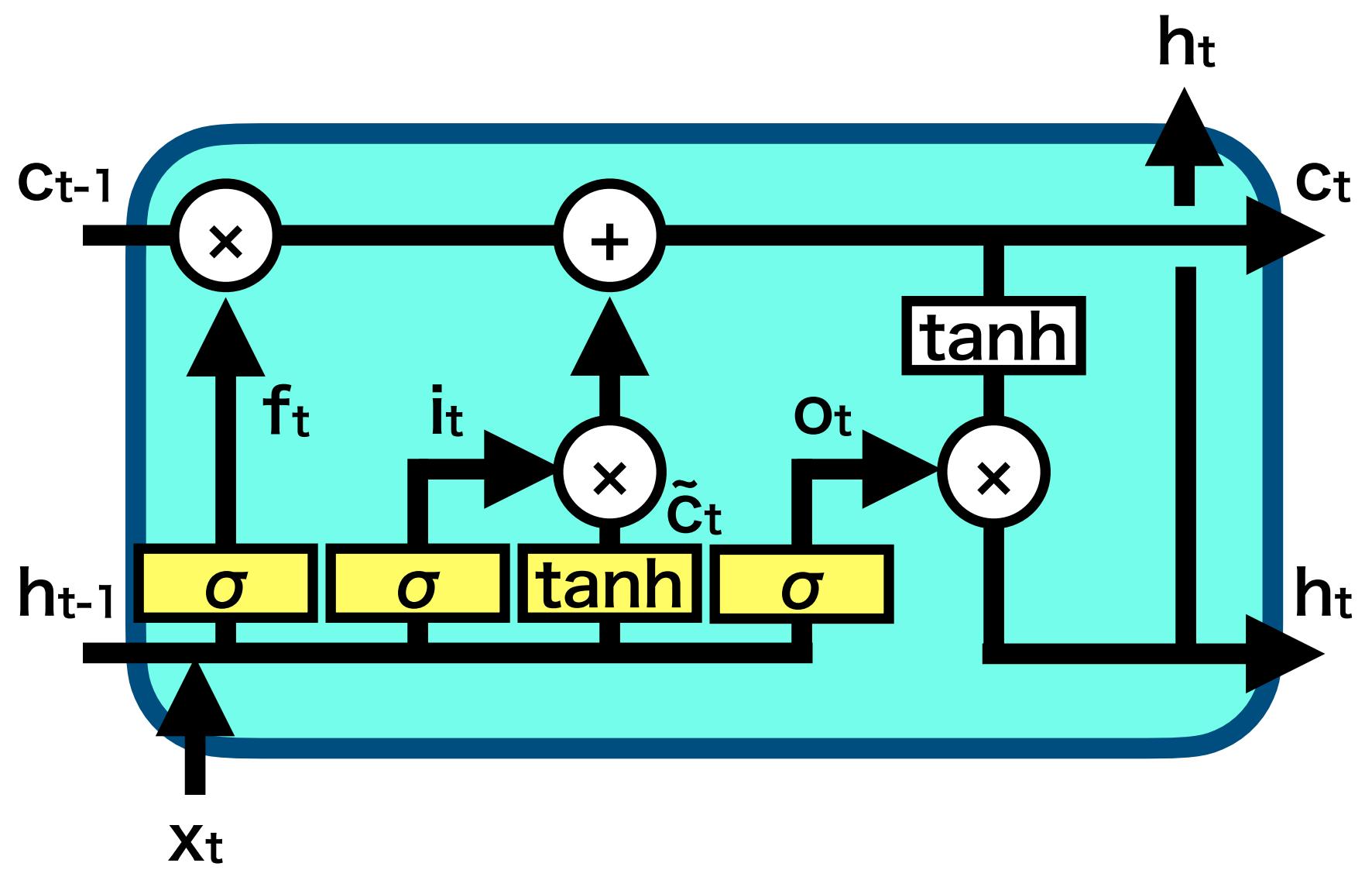
Many to Many



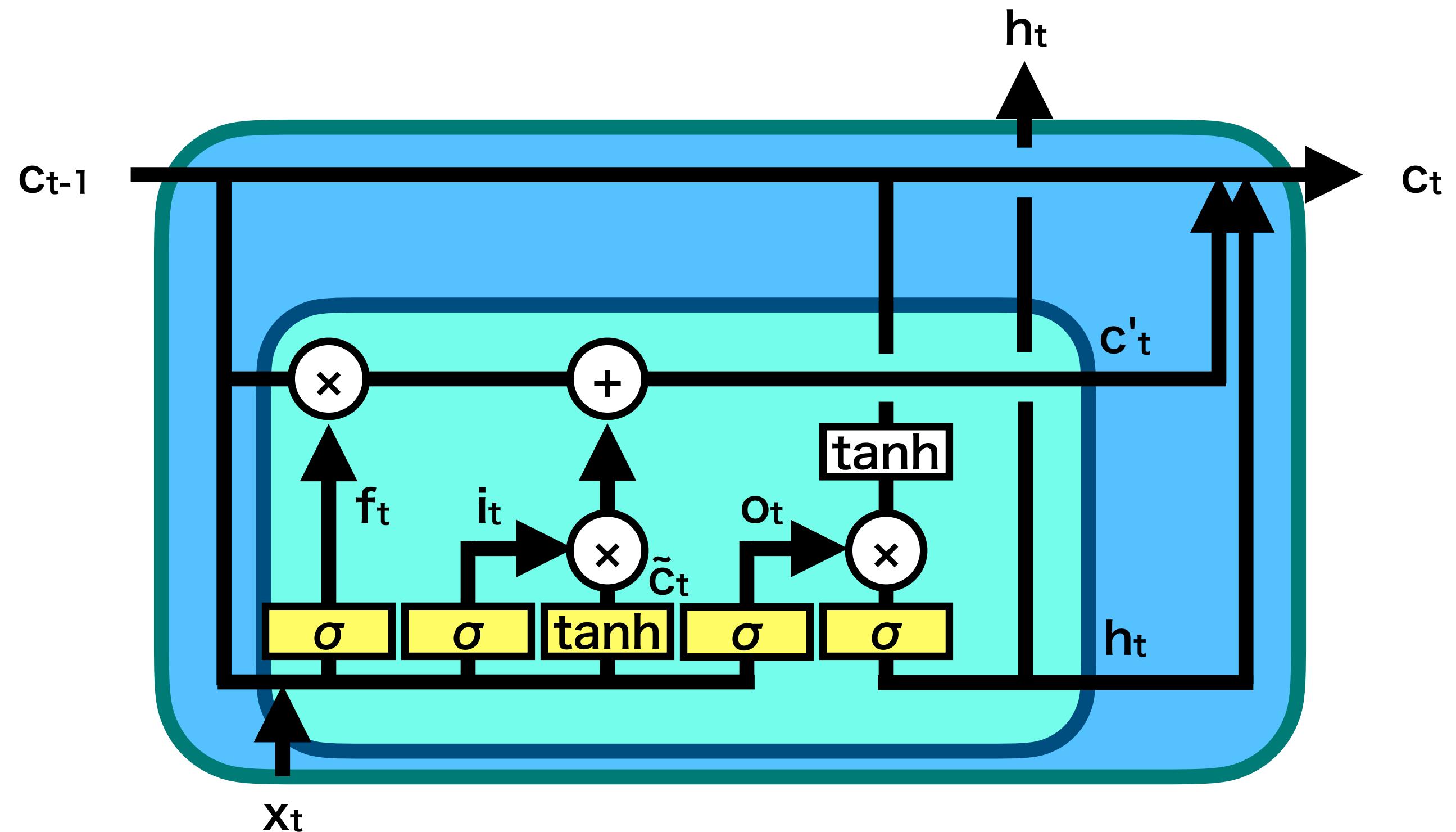


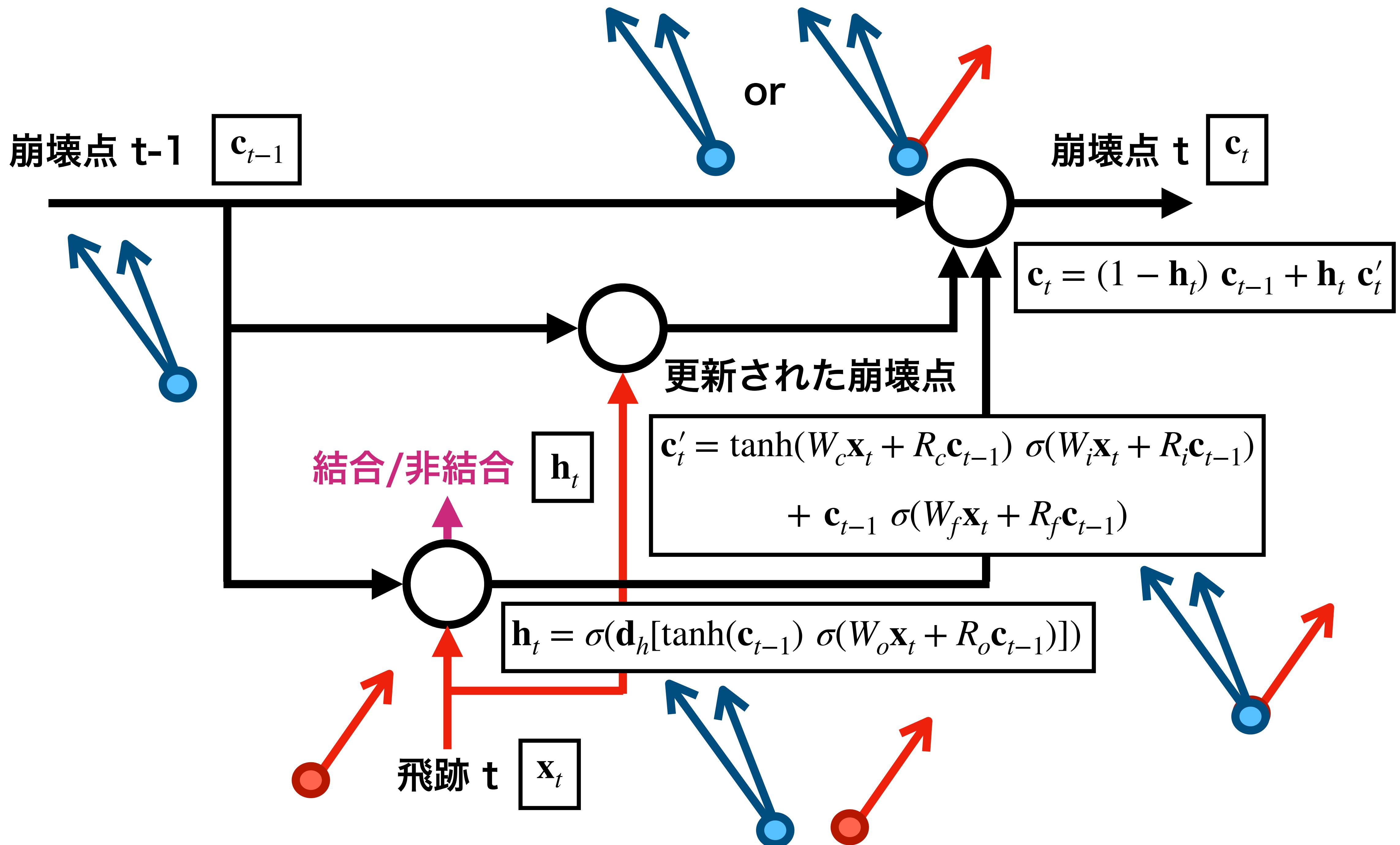


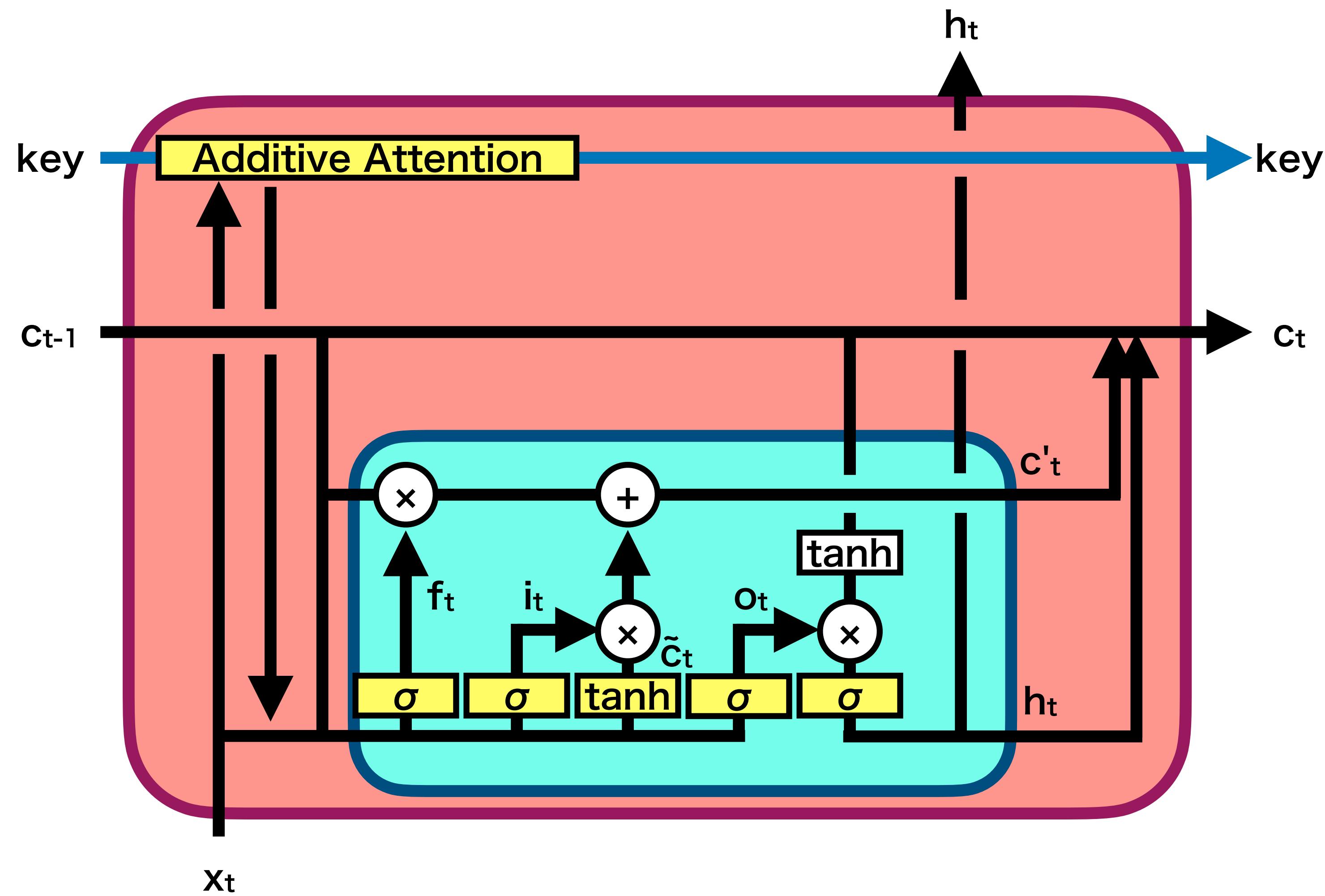
LSTM

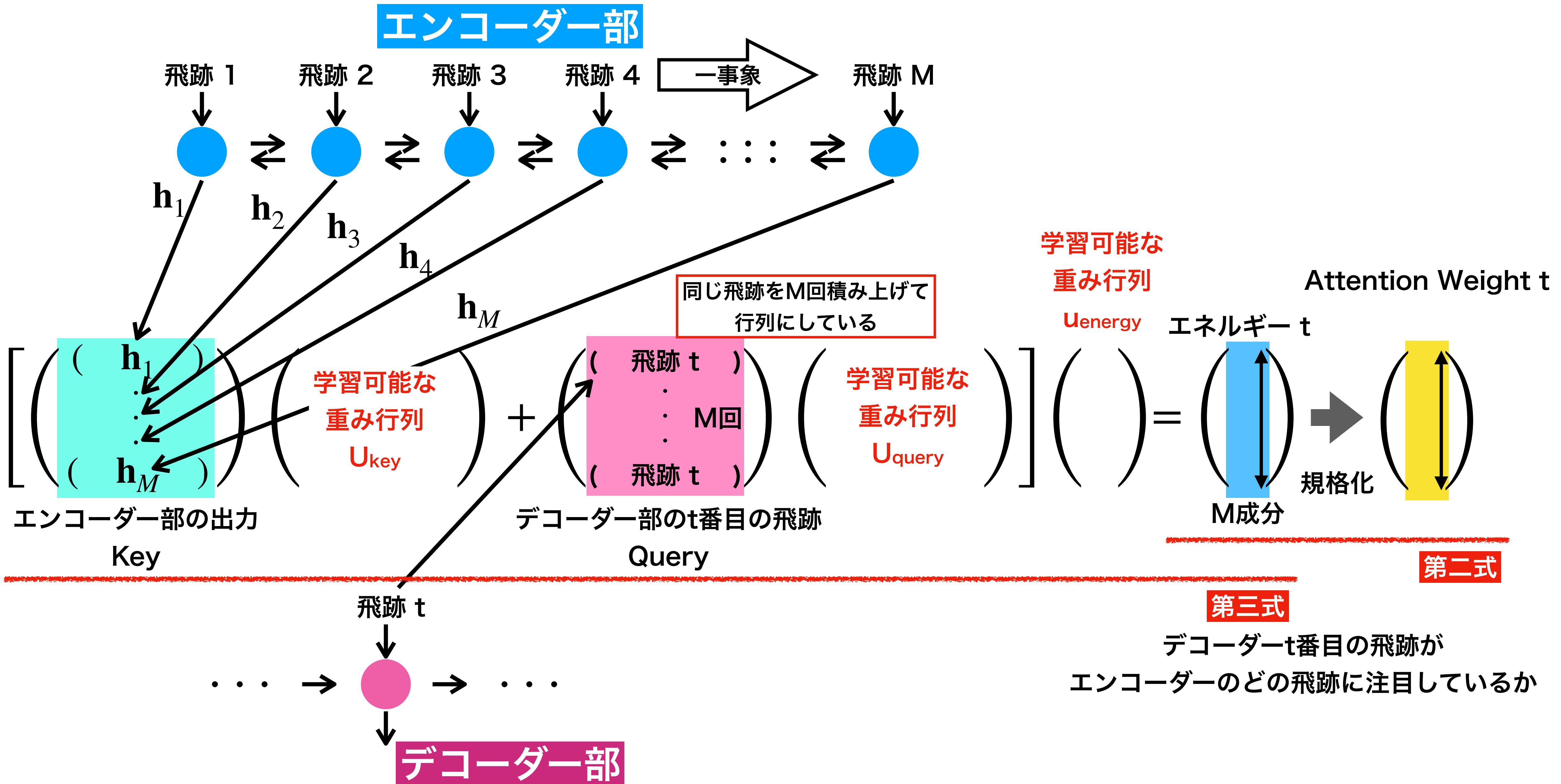


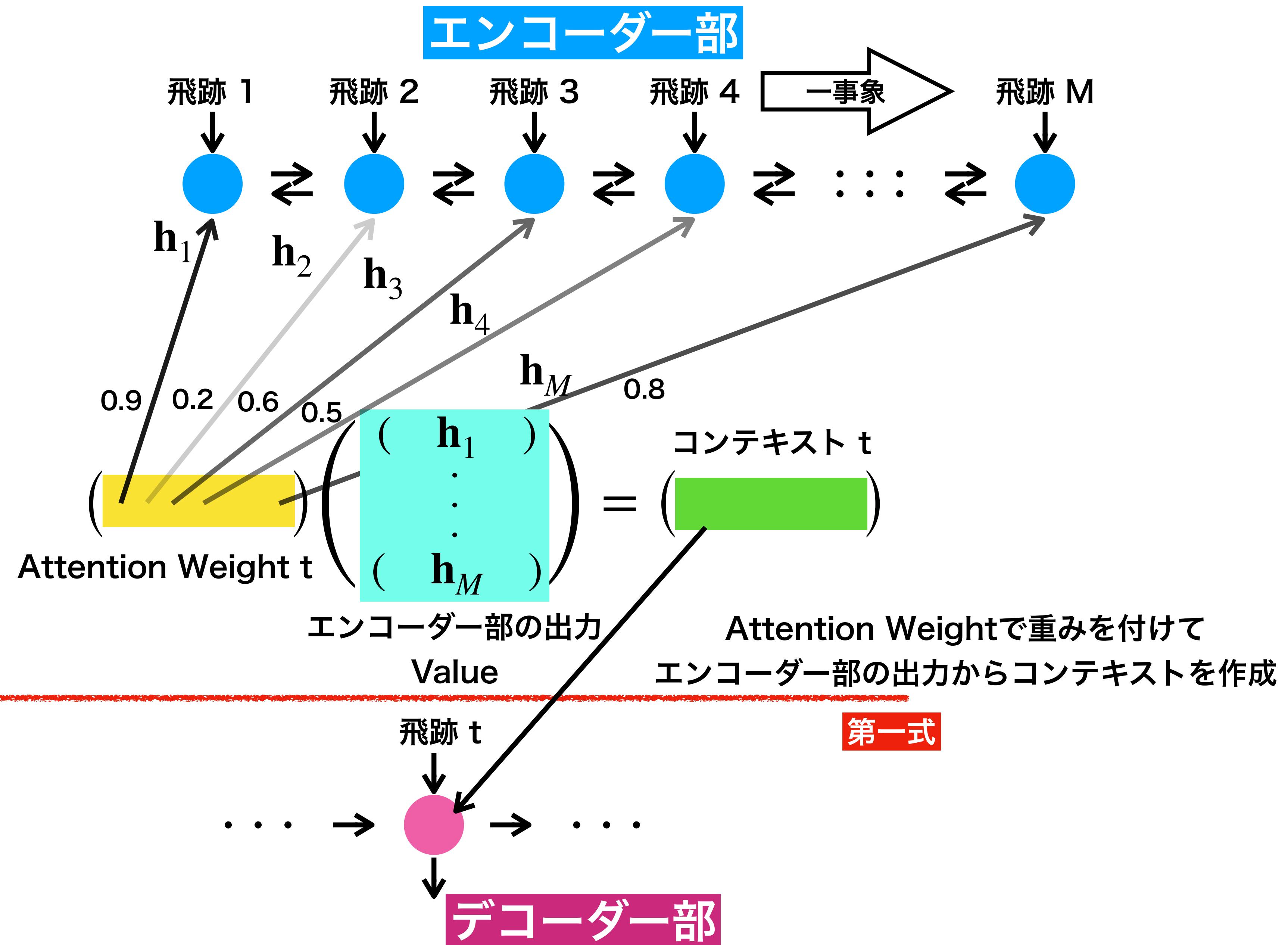
崩壊点生成のための リカレントニューラルネットワーク

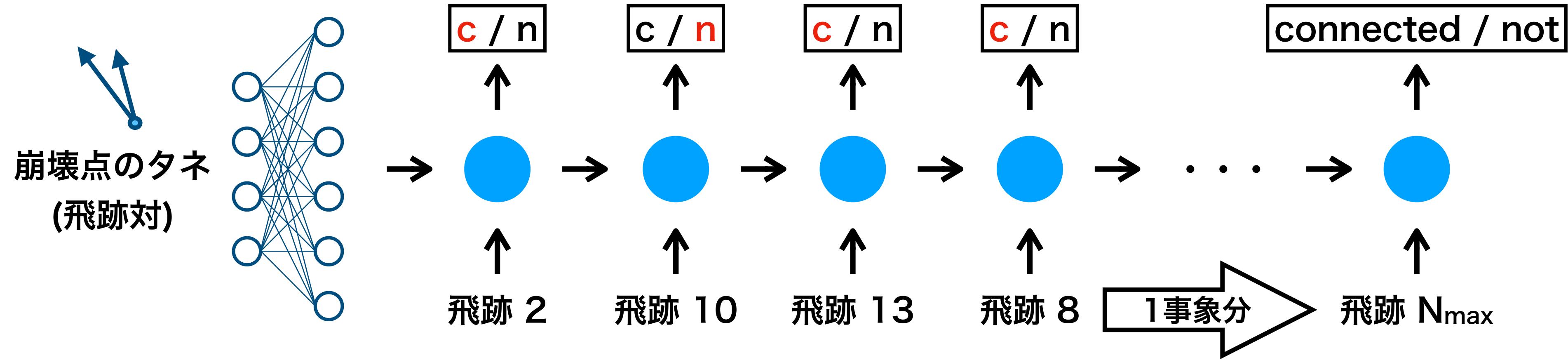
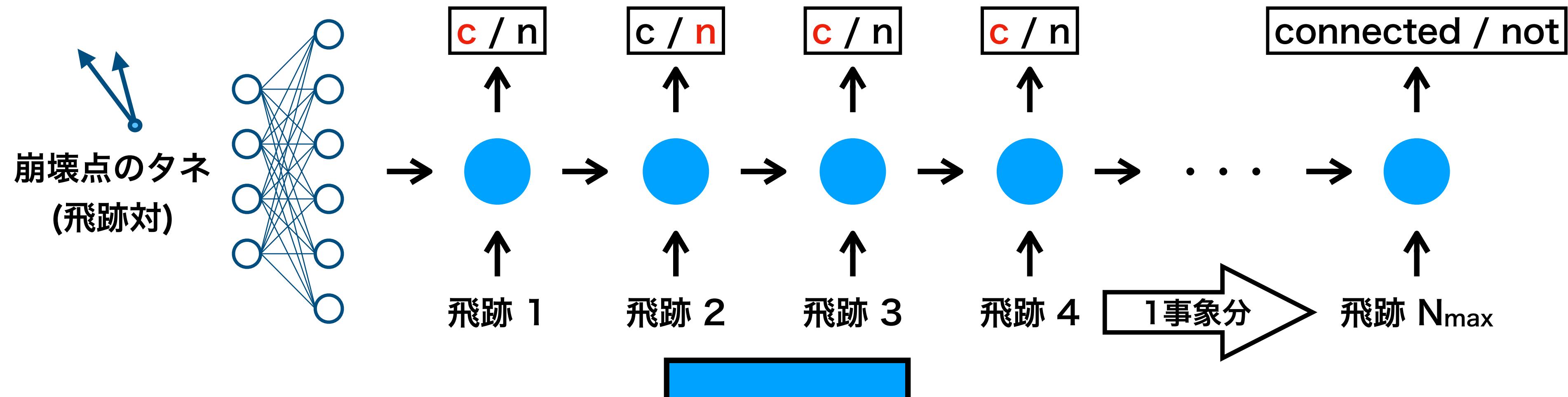




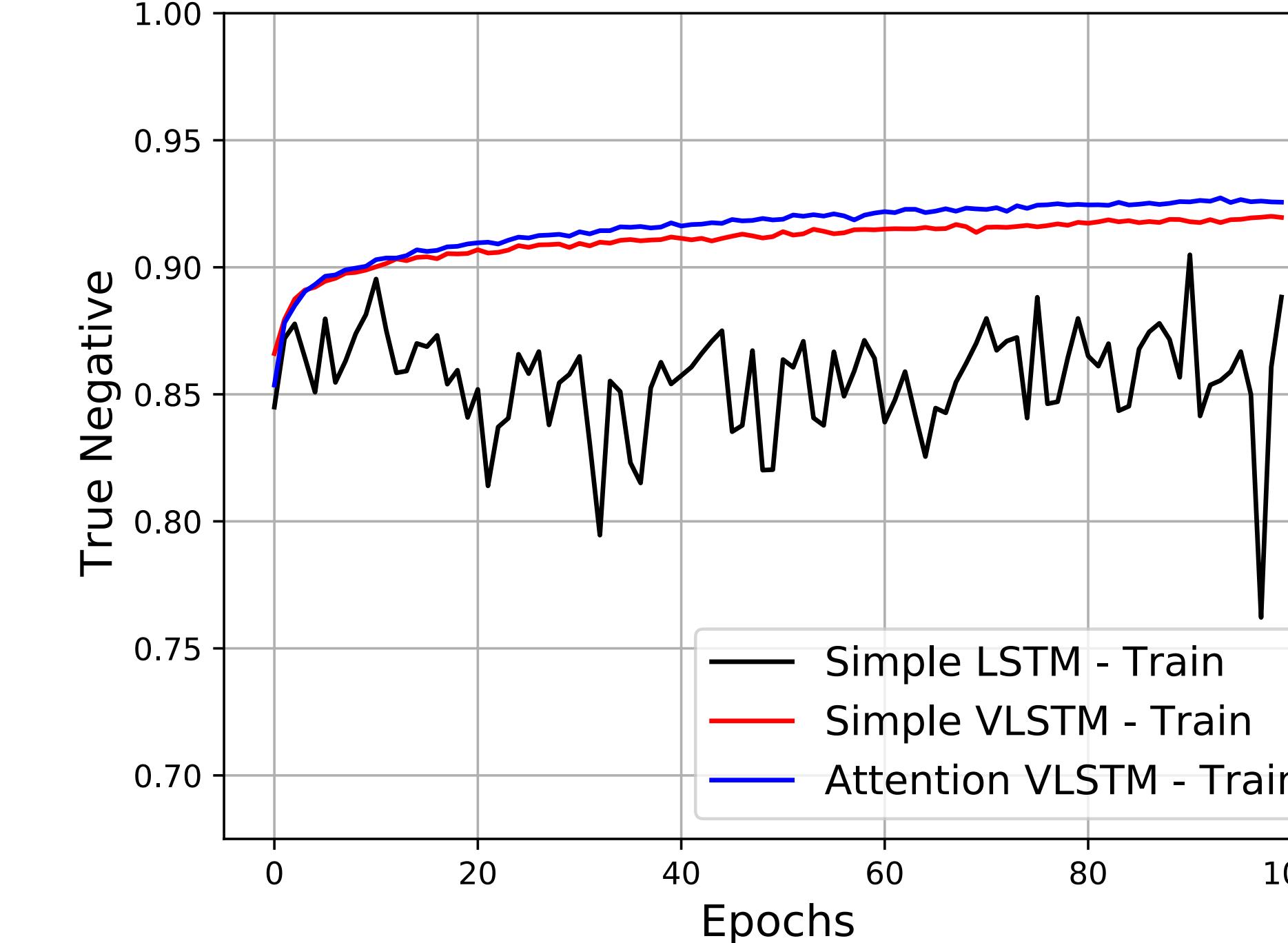
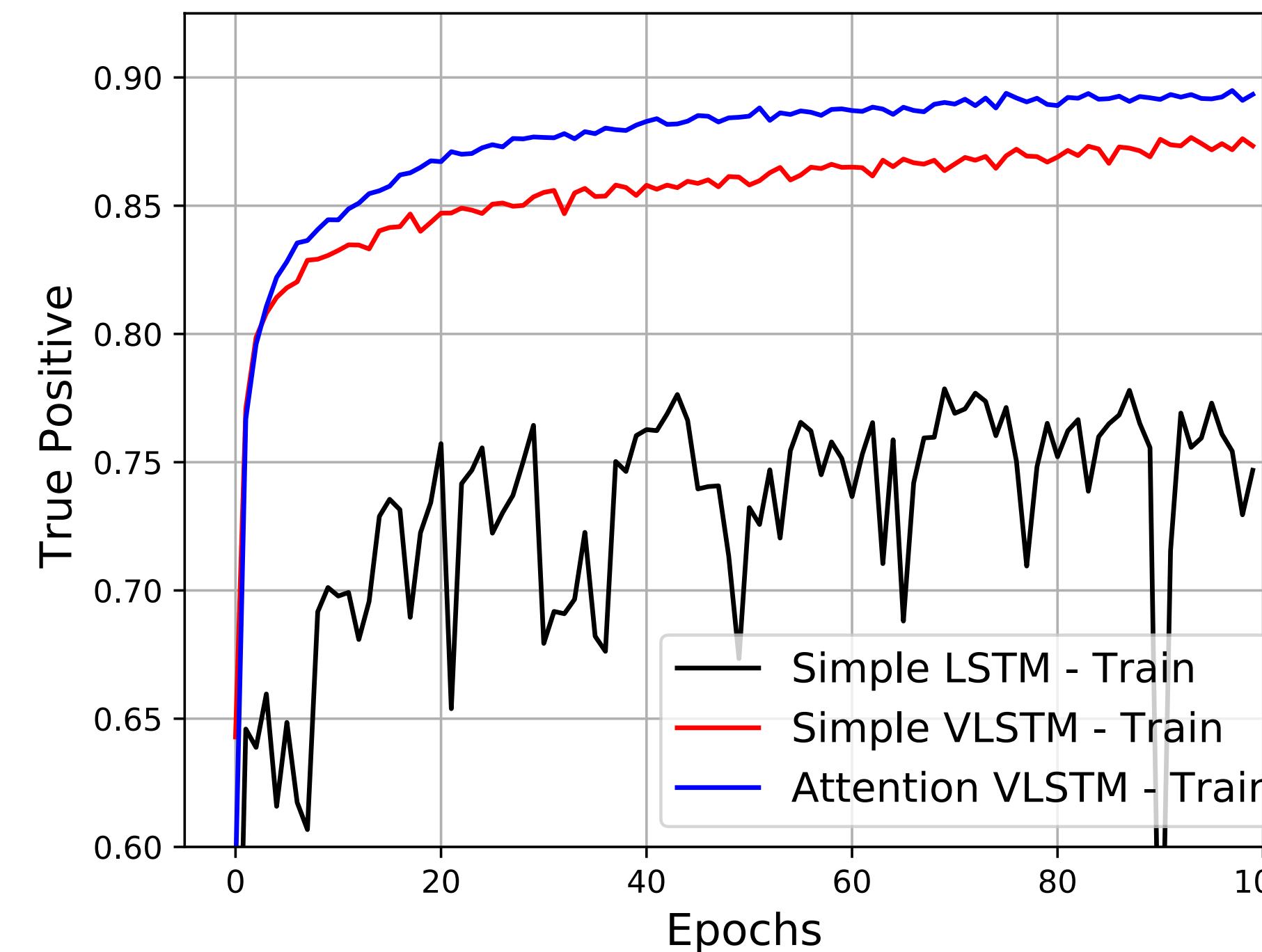
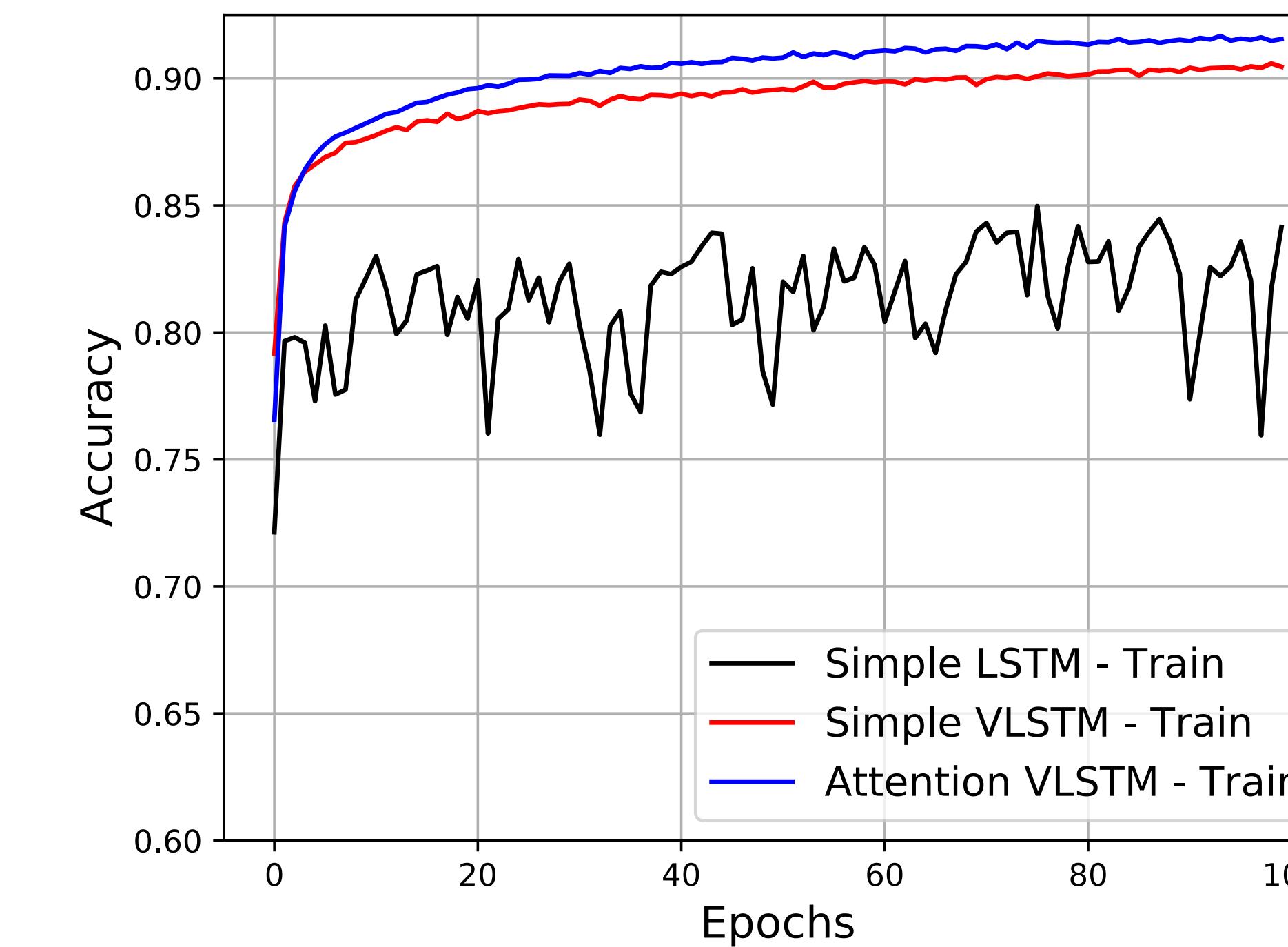
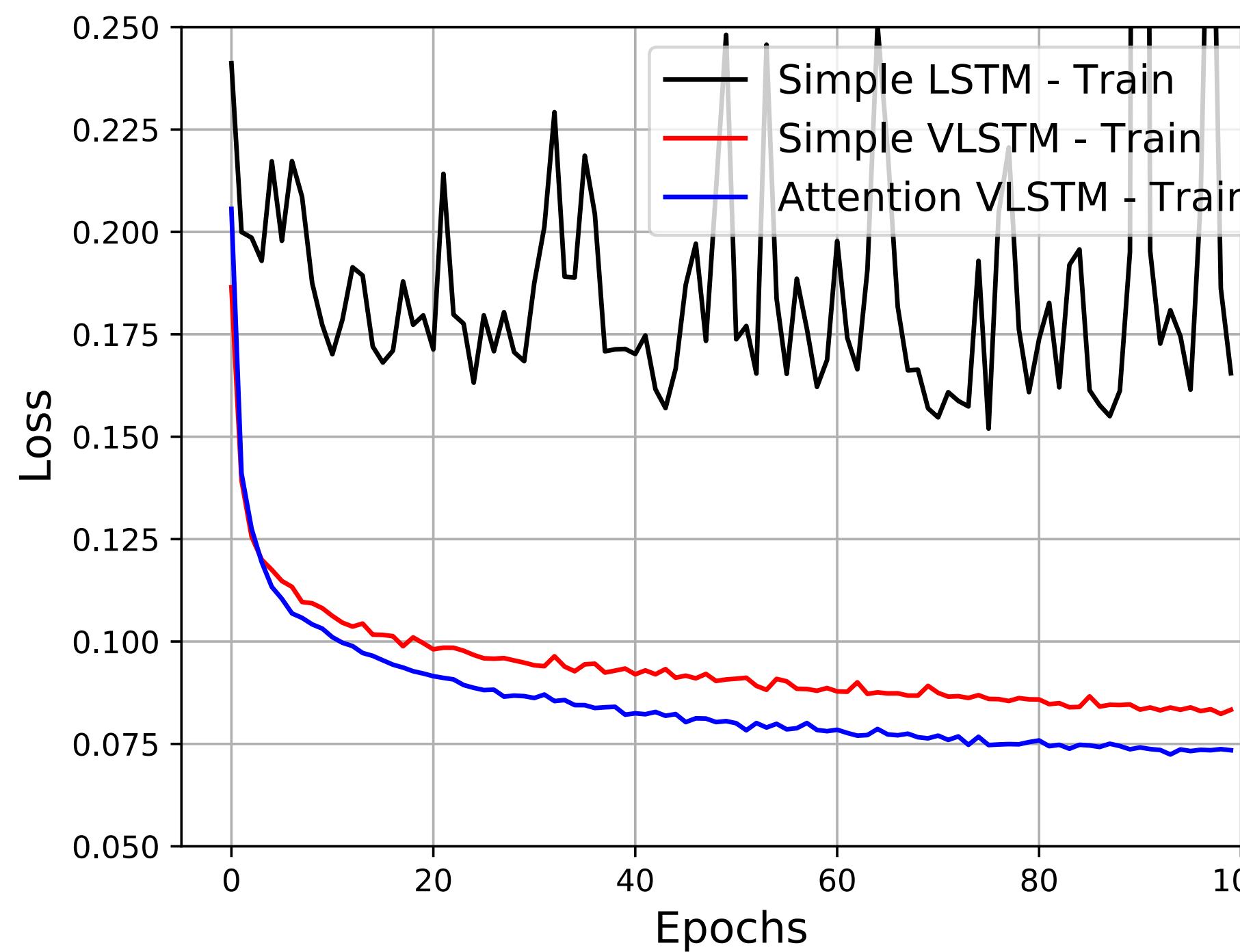


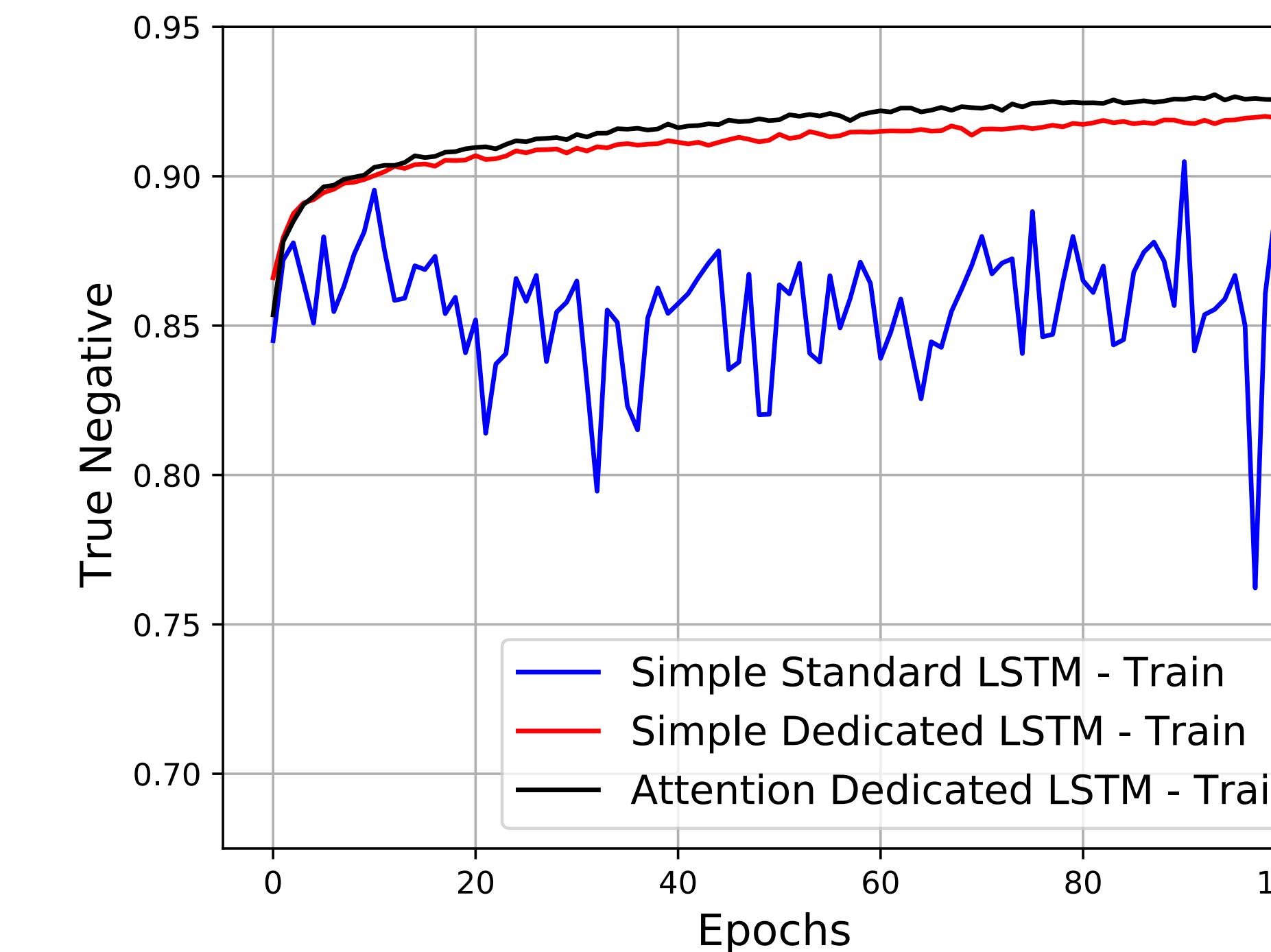
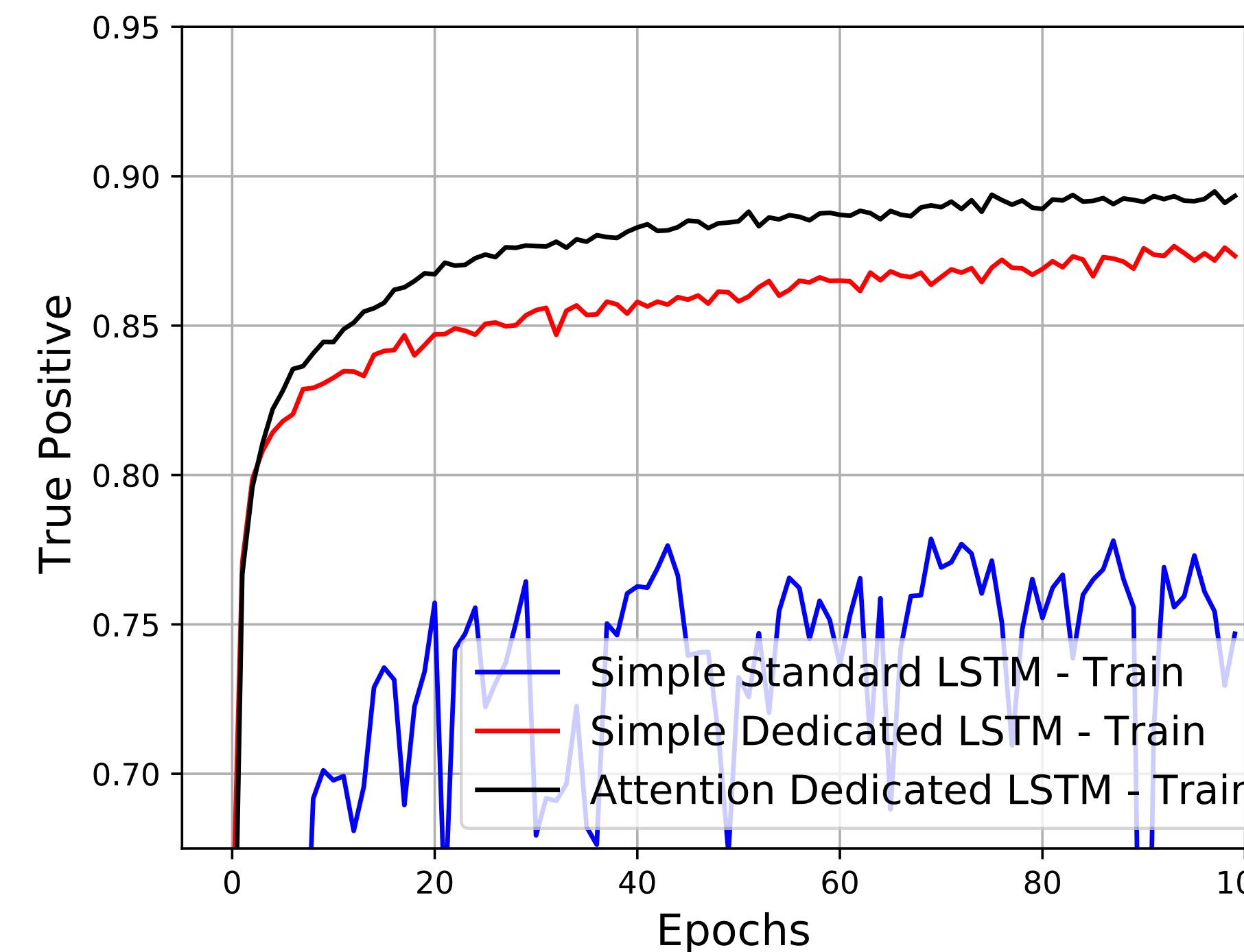
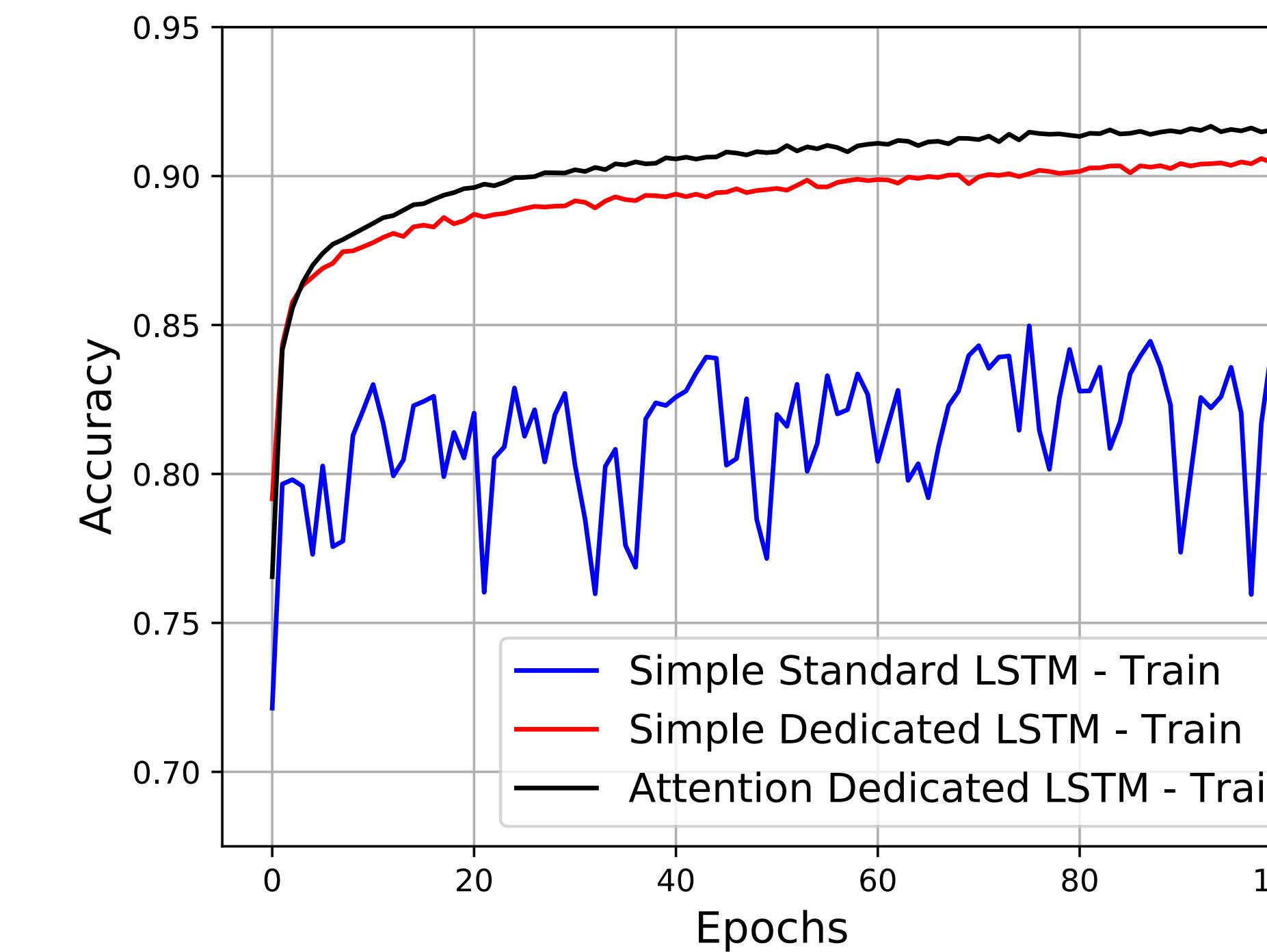
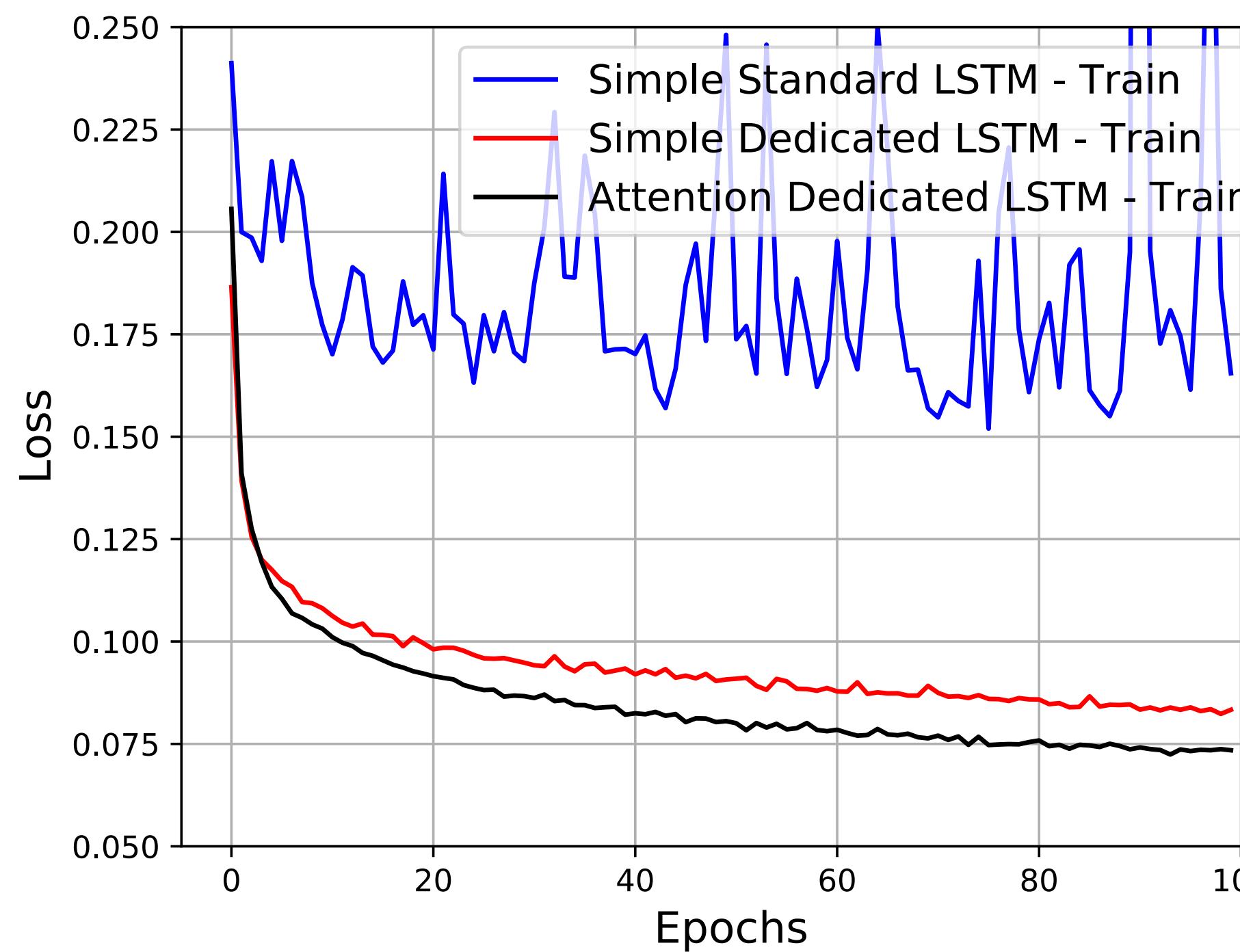


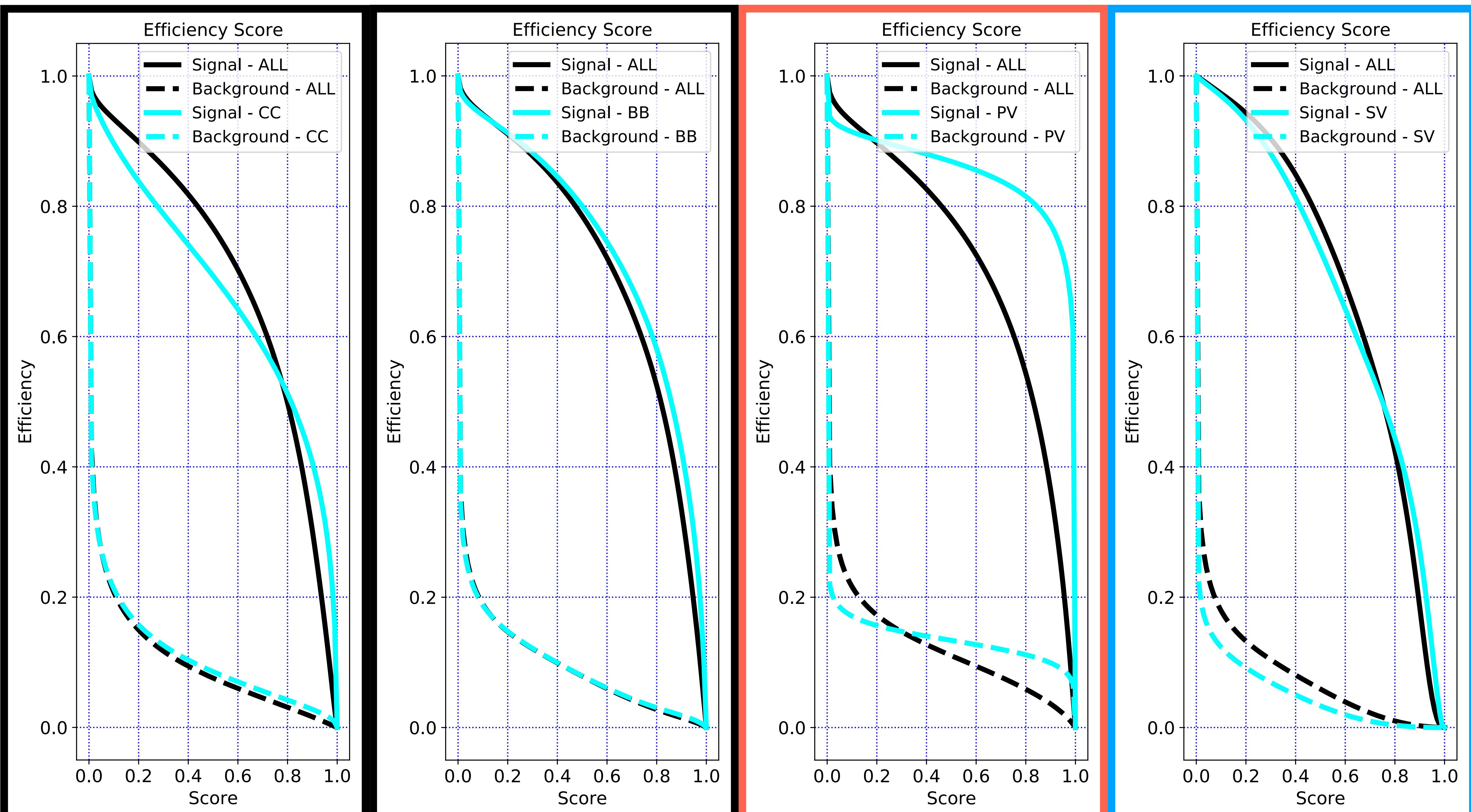


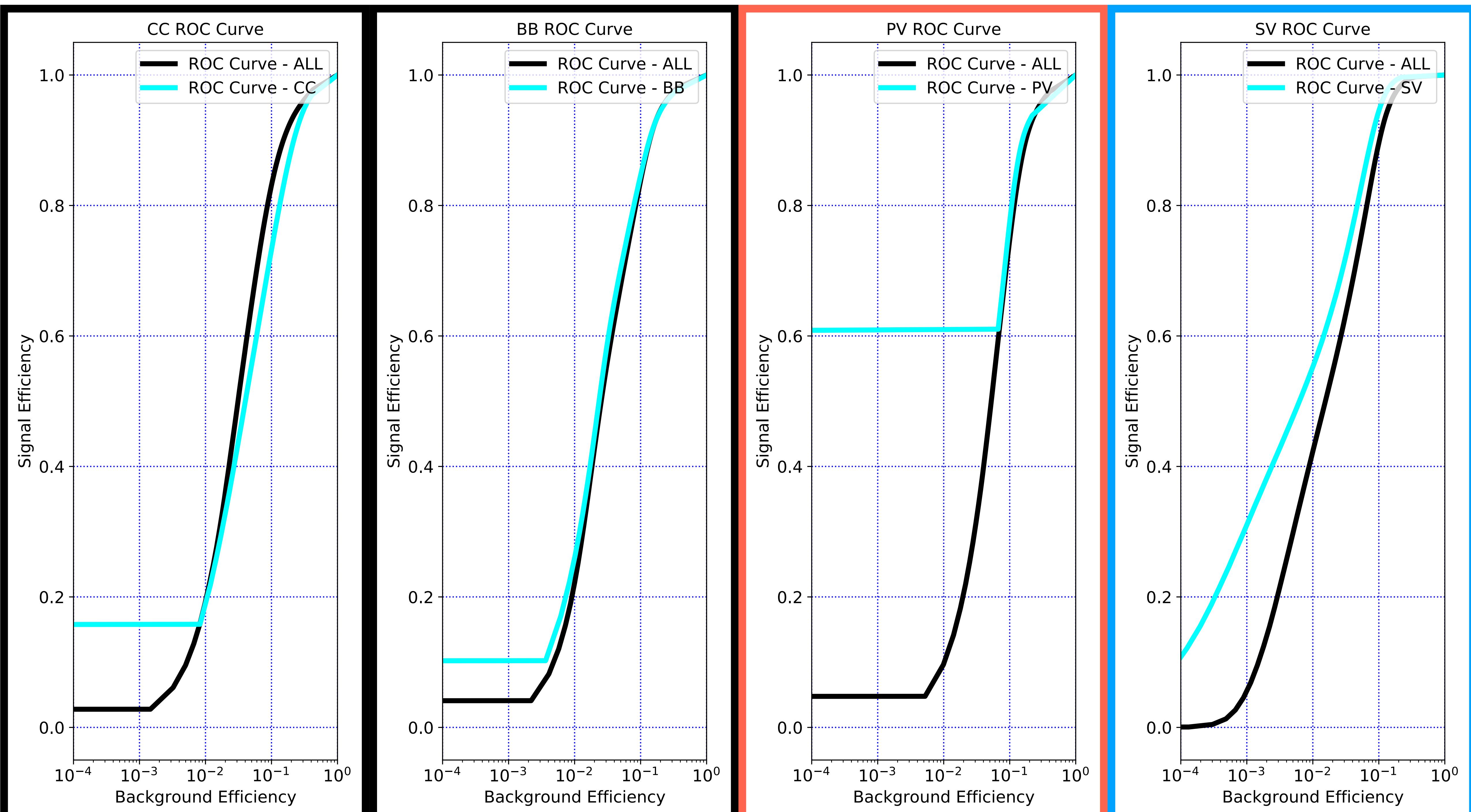


飛跡順のシャッフル





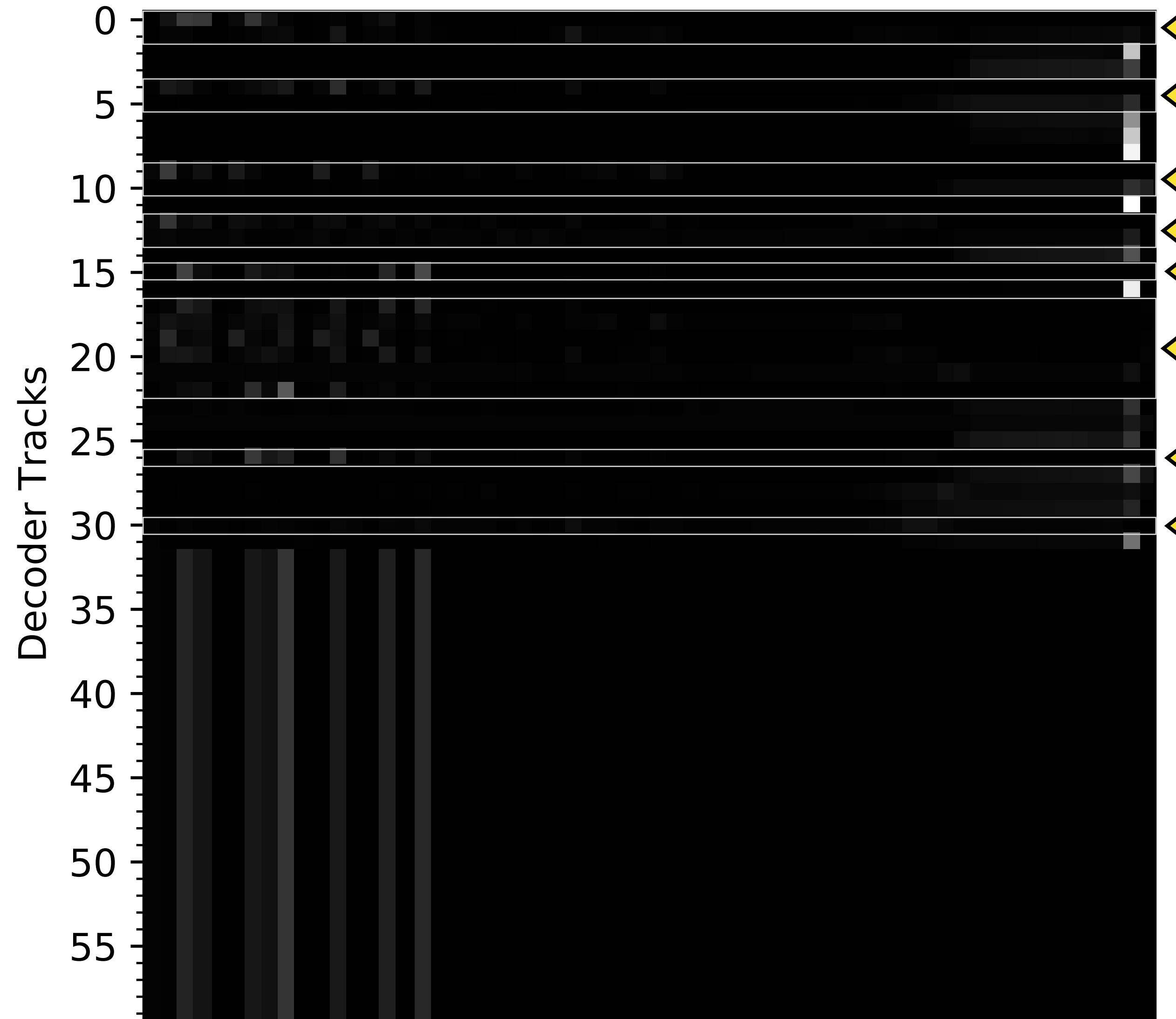




Attention Weight Map

Connected tracks are

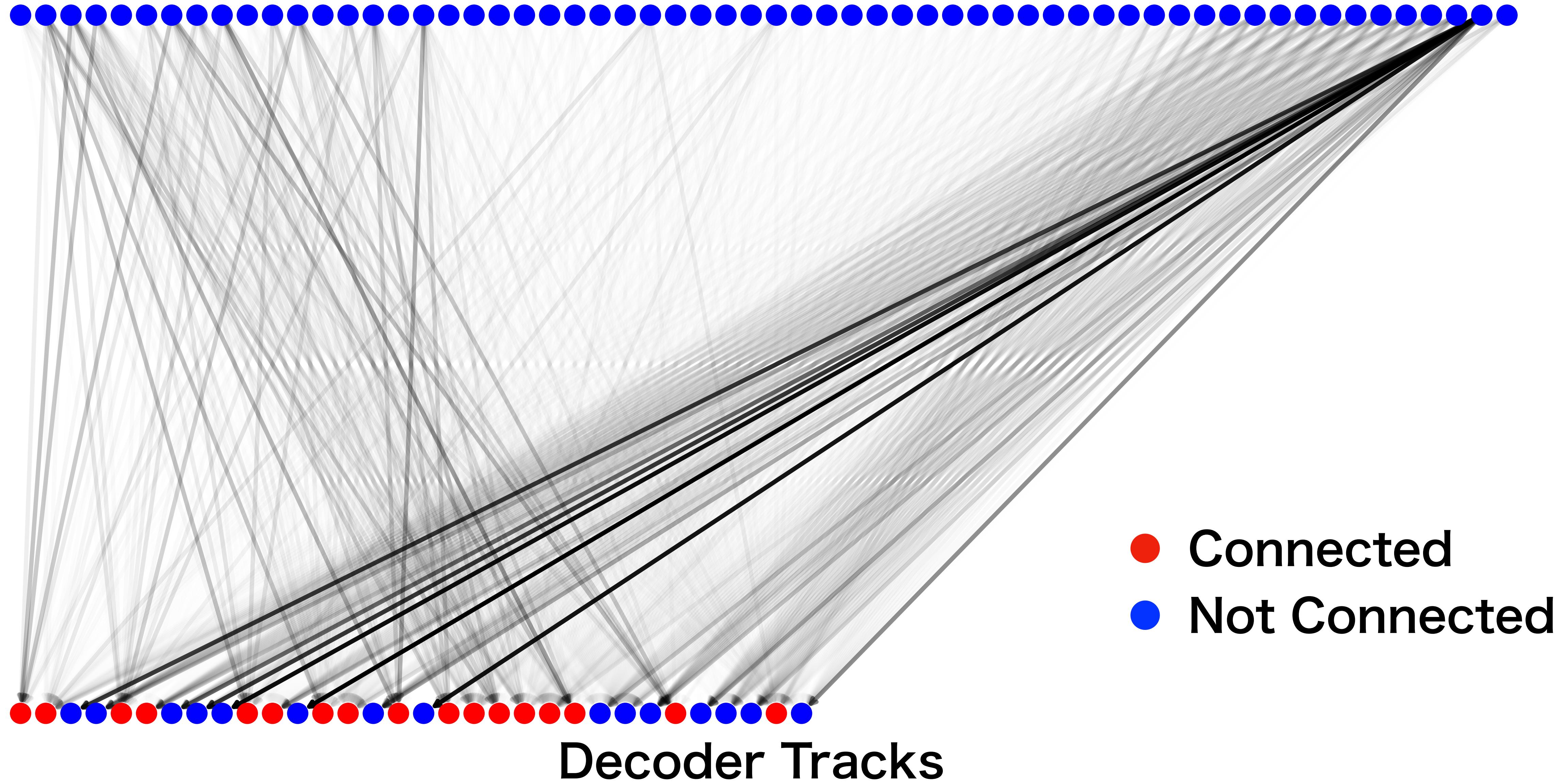
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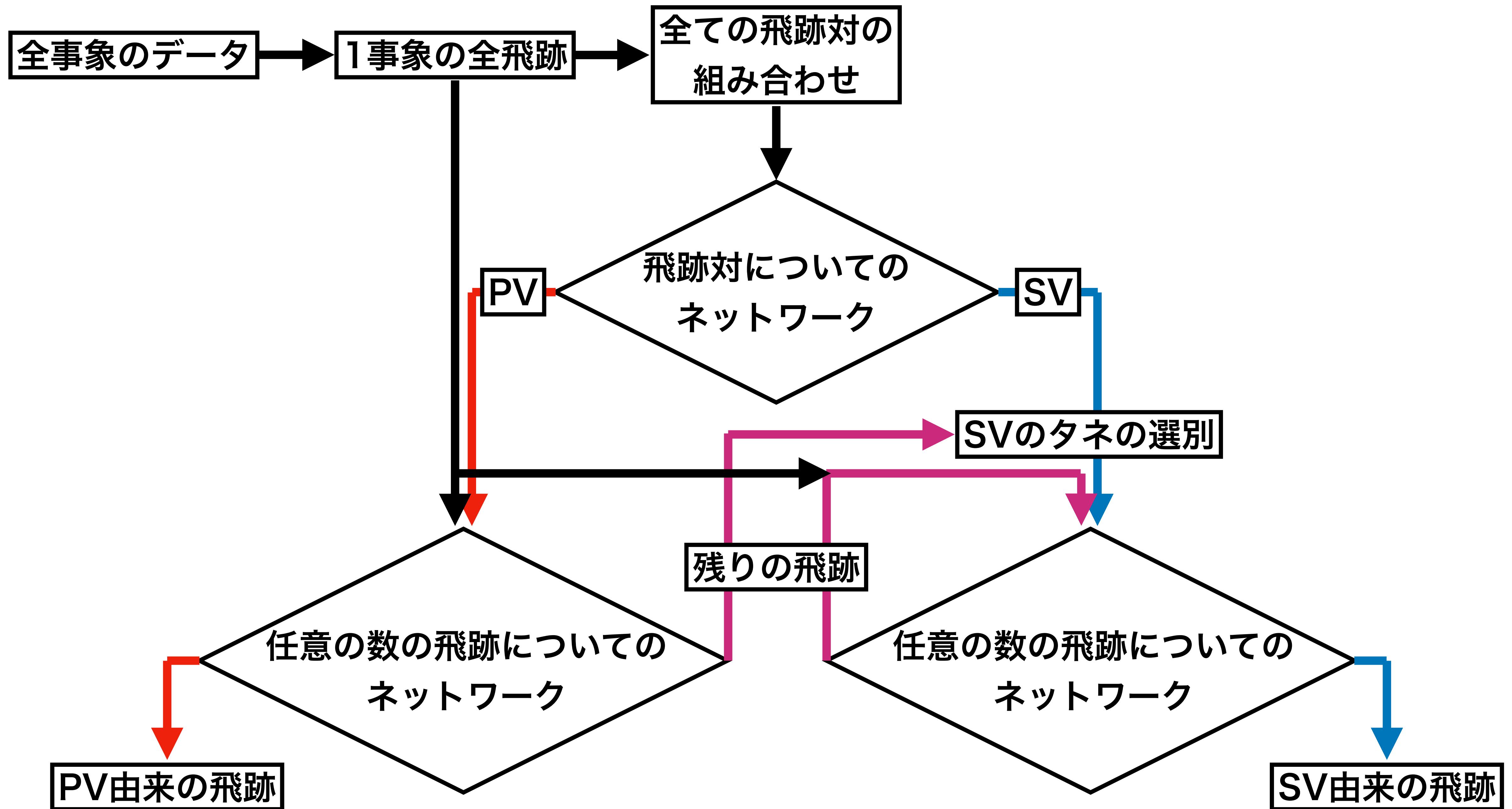


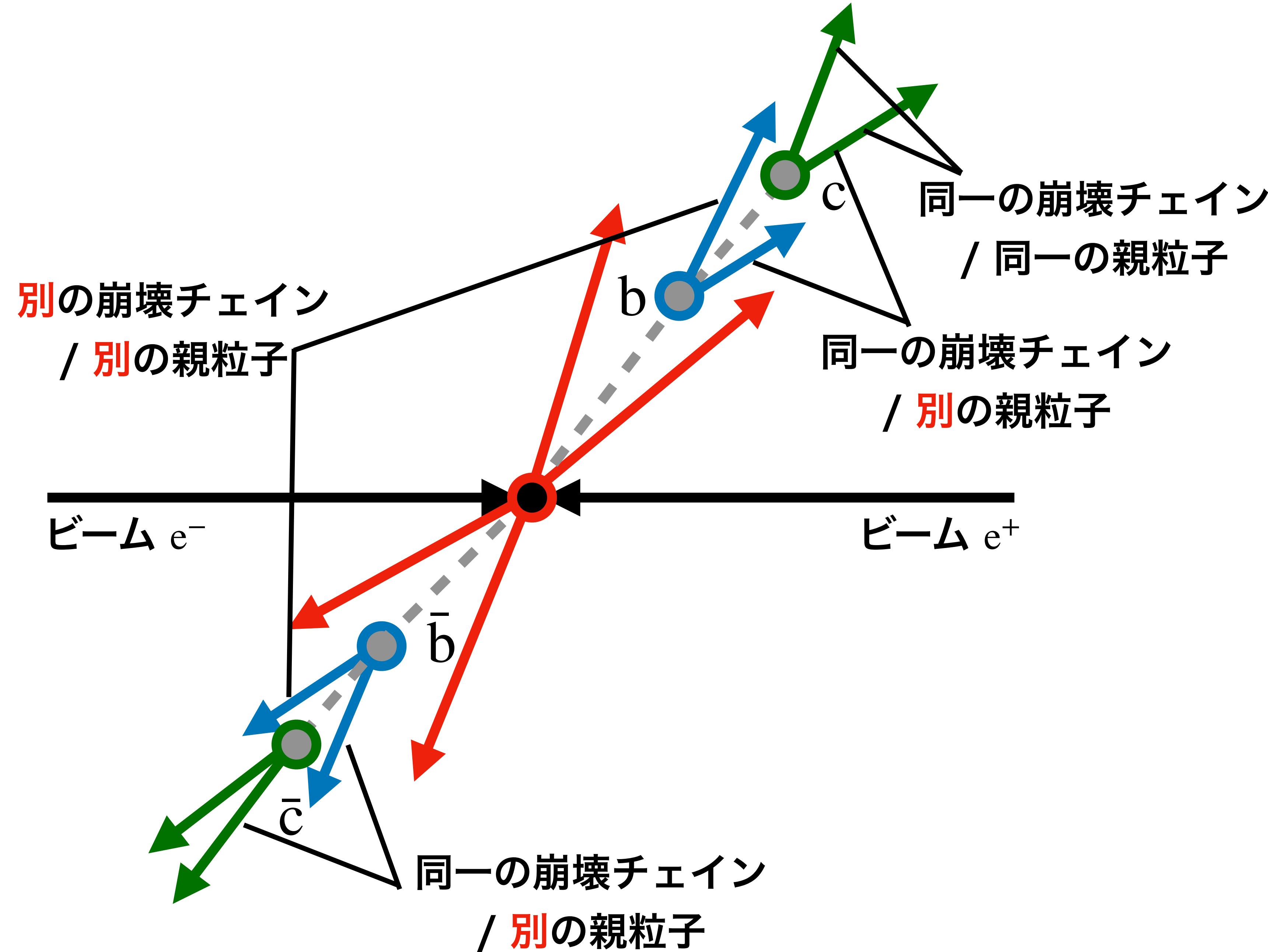
Encoder Tracks

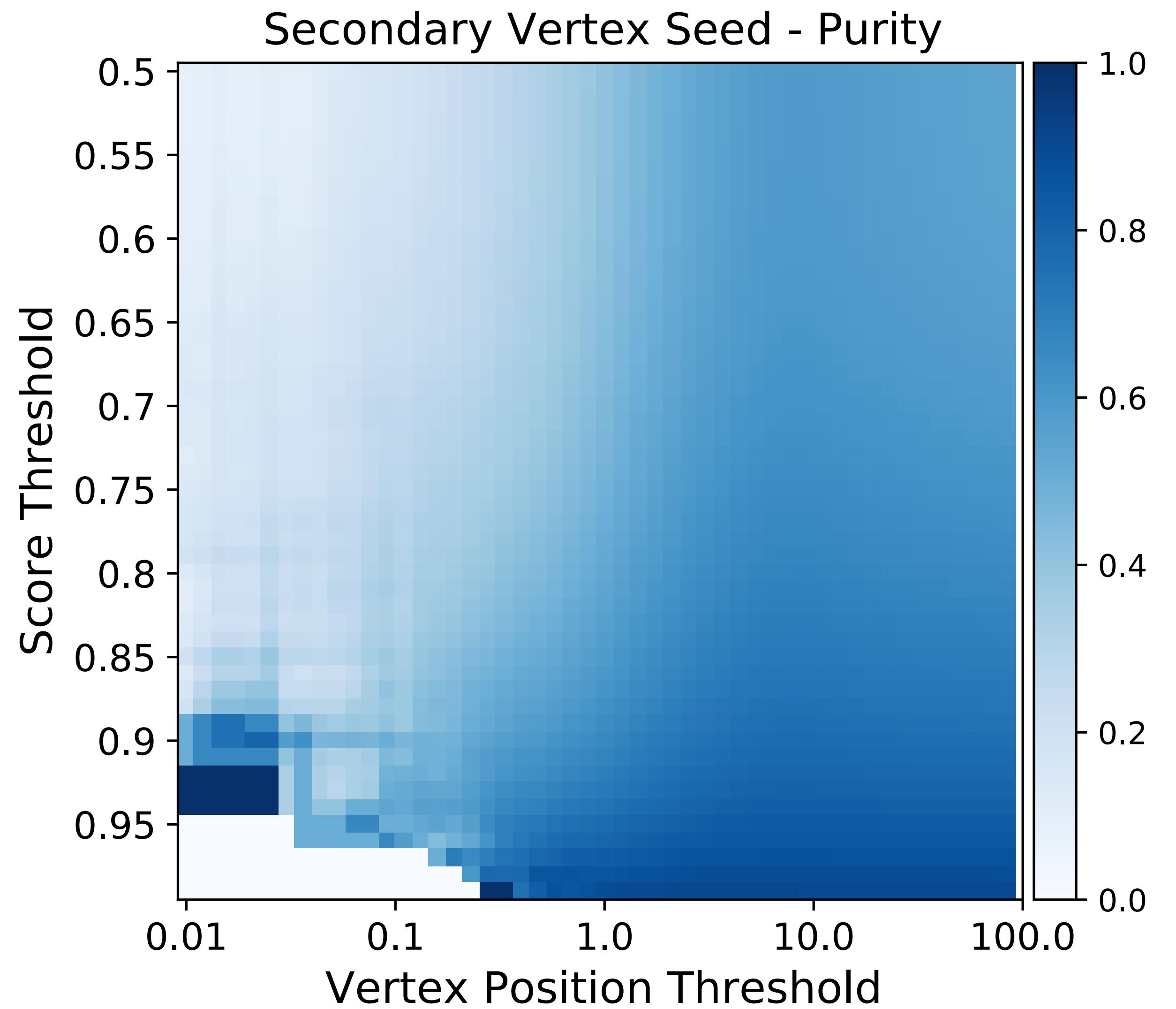
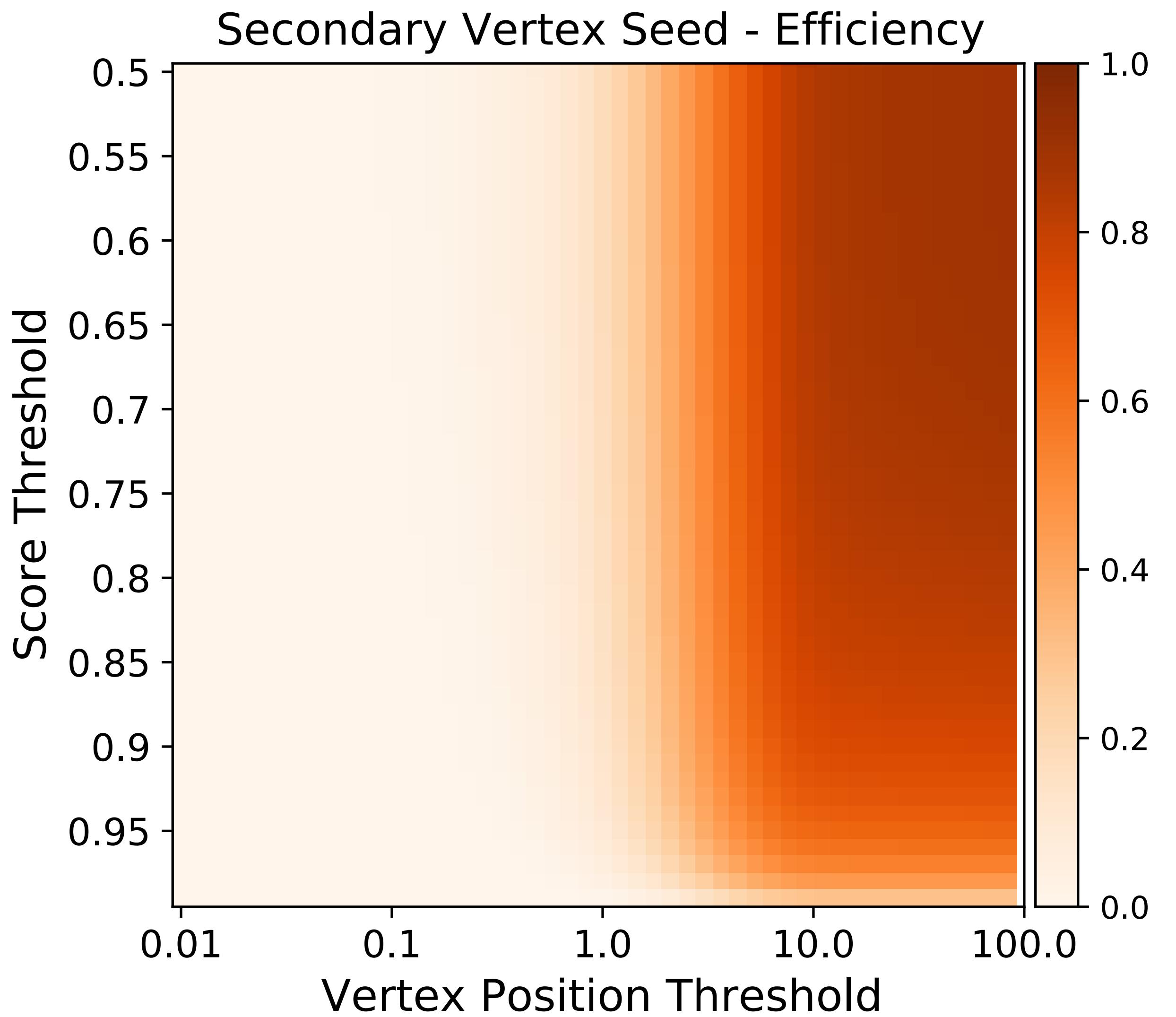
Attention Weight Graph

Encoder Tracks

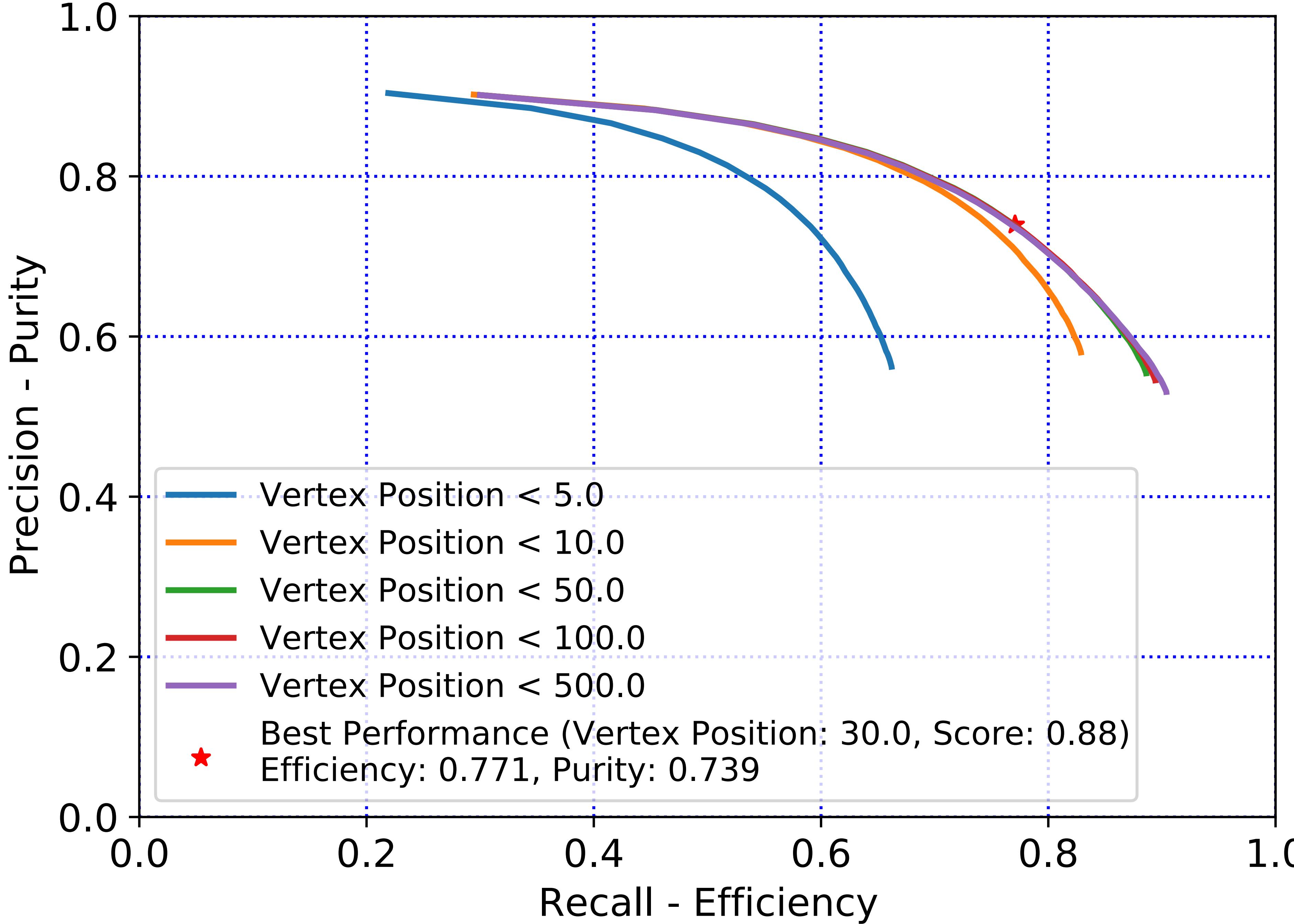


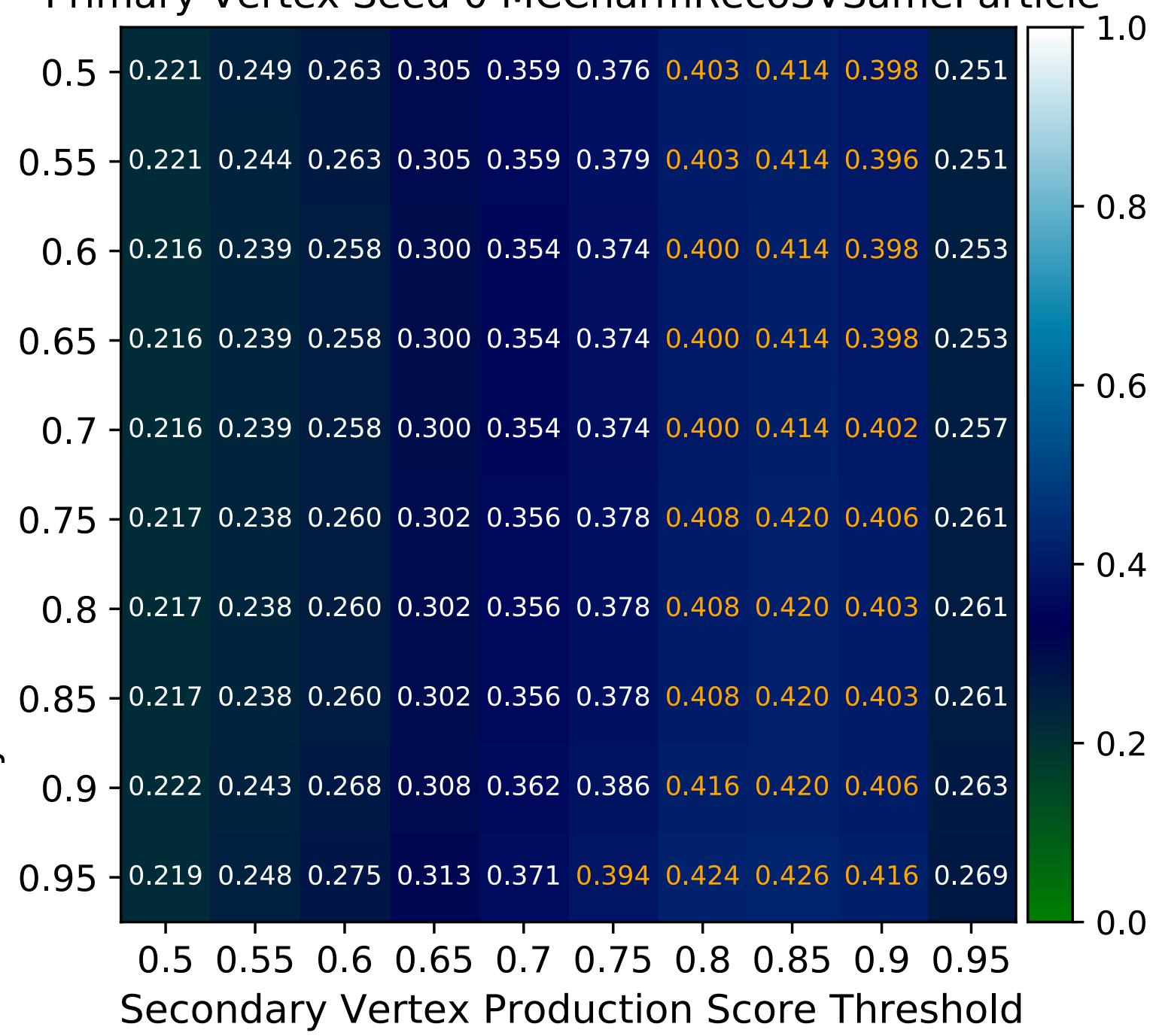
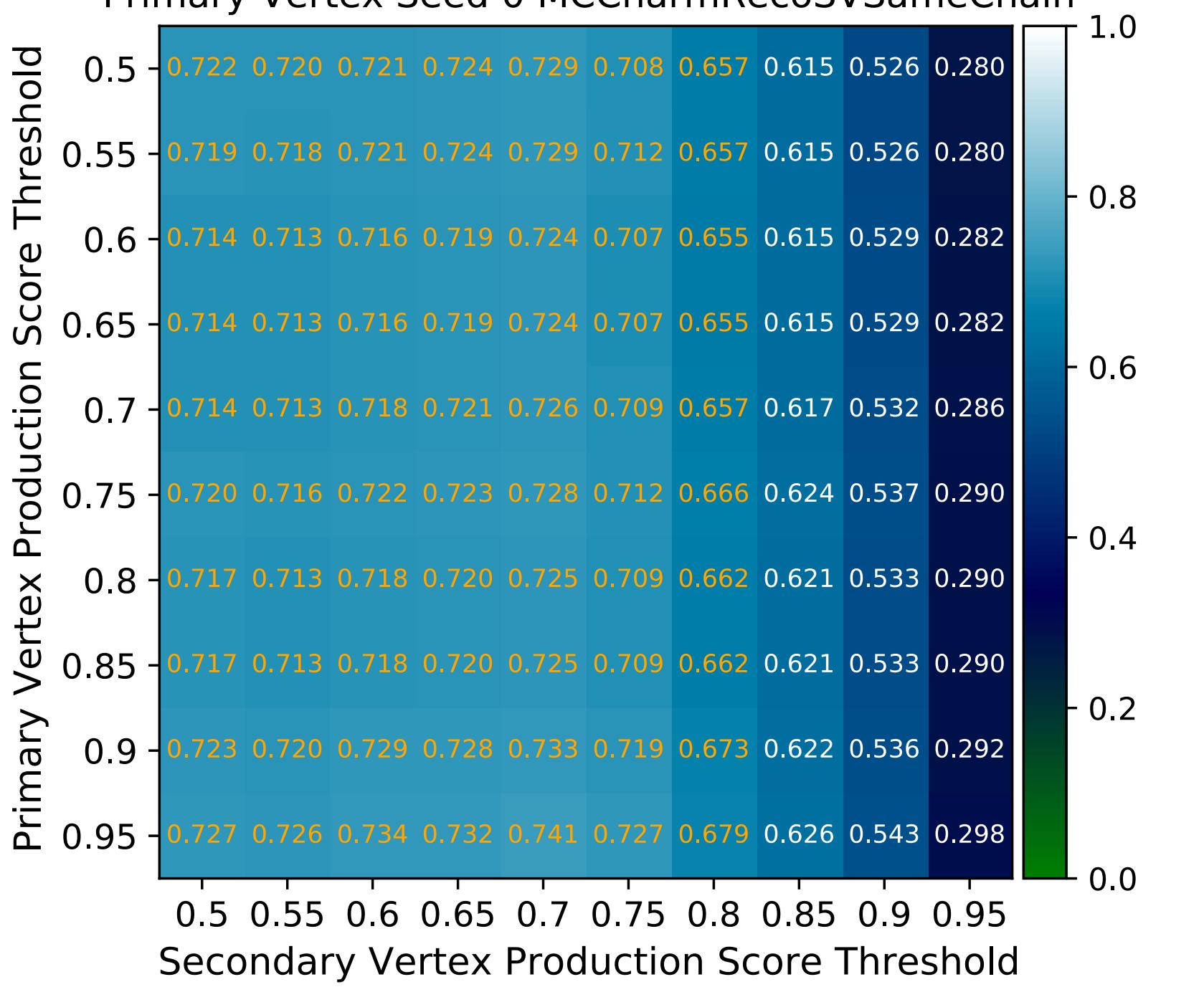
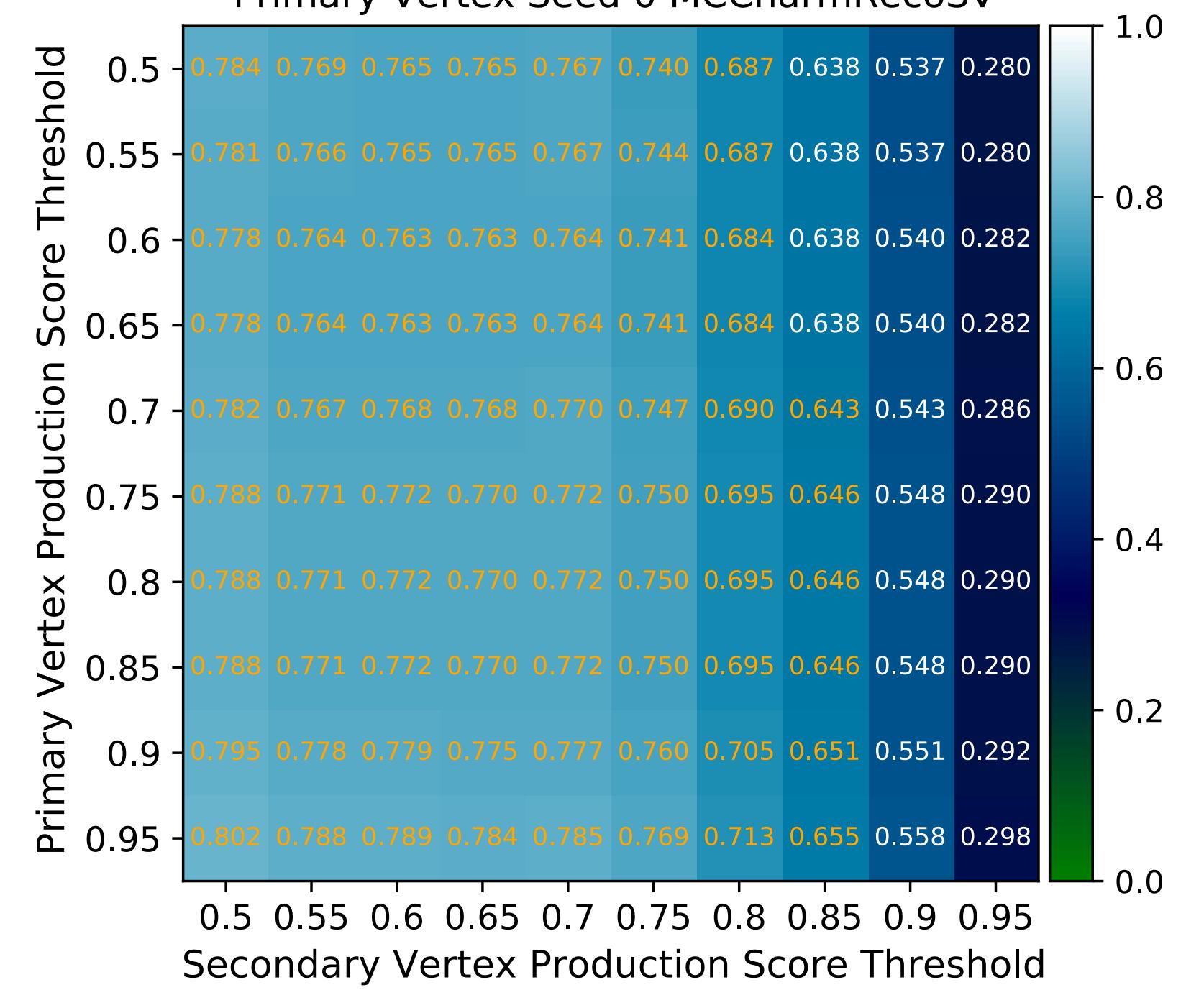
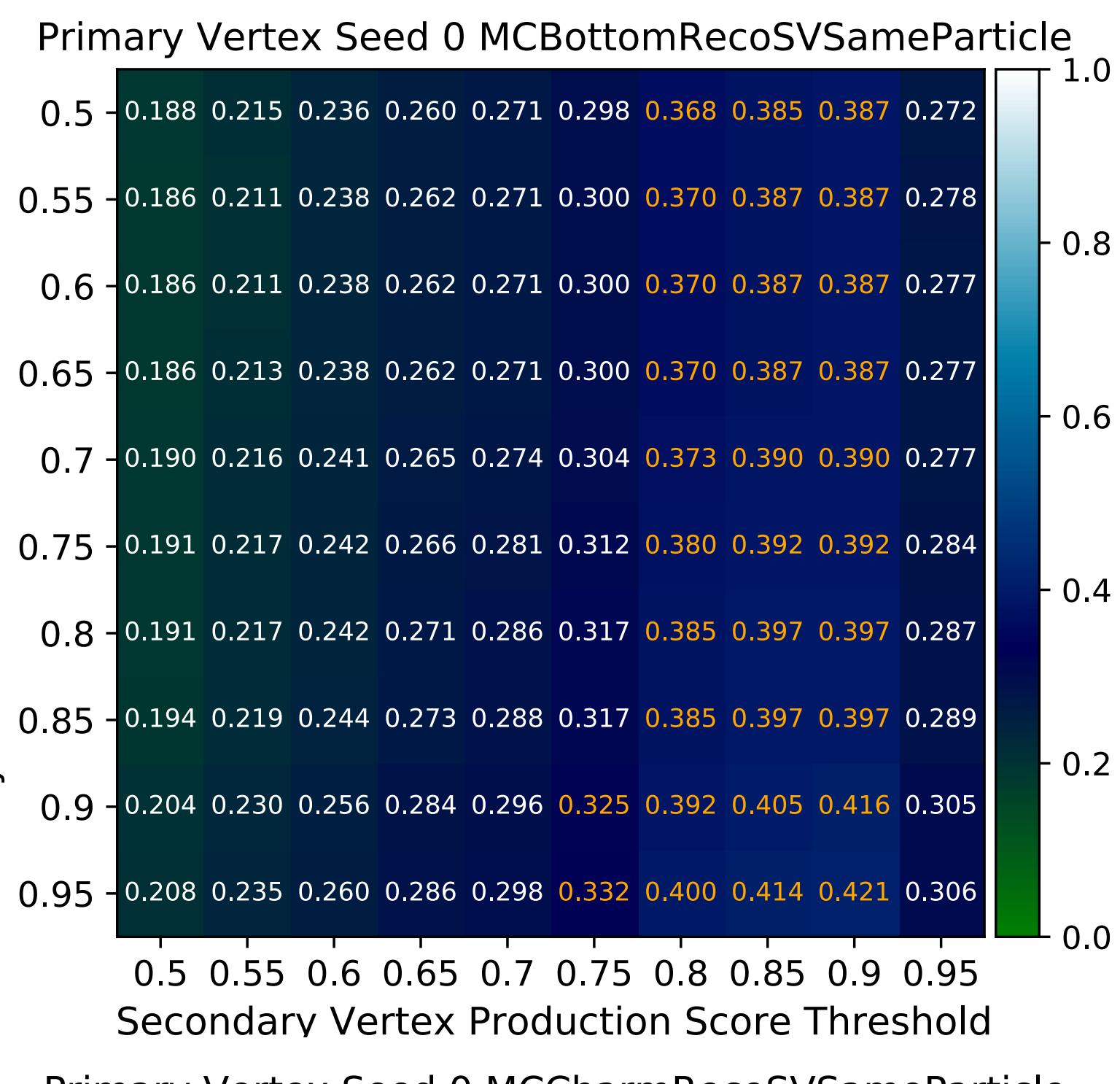
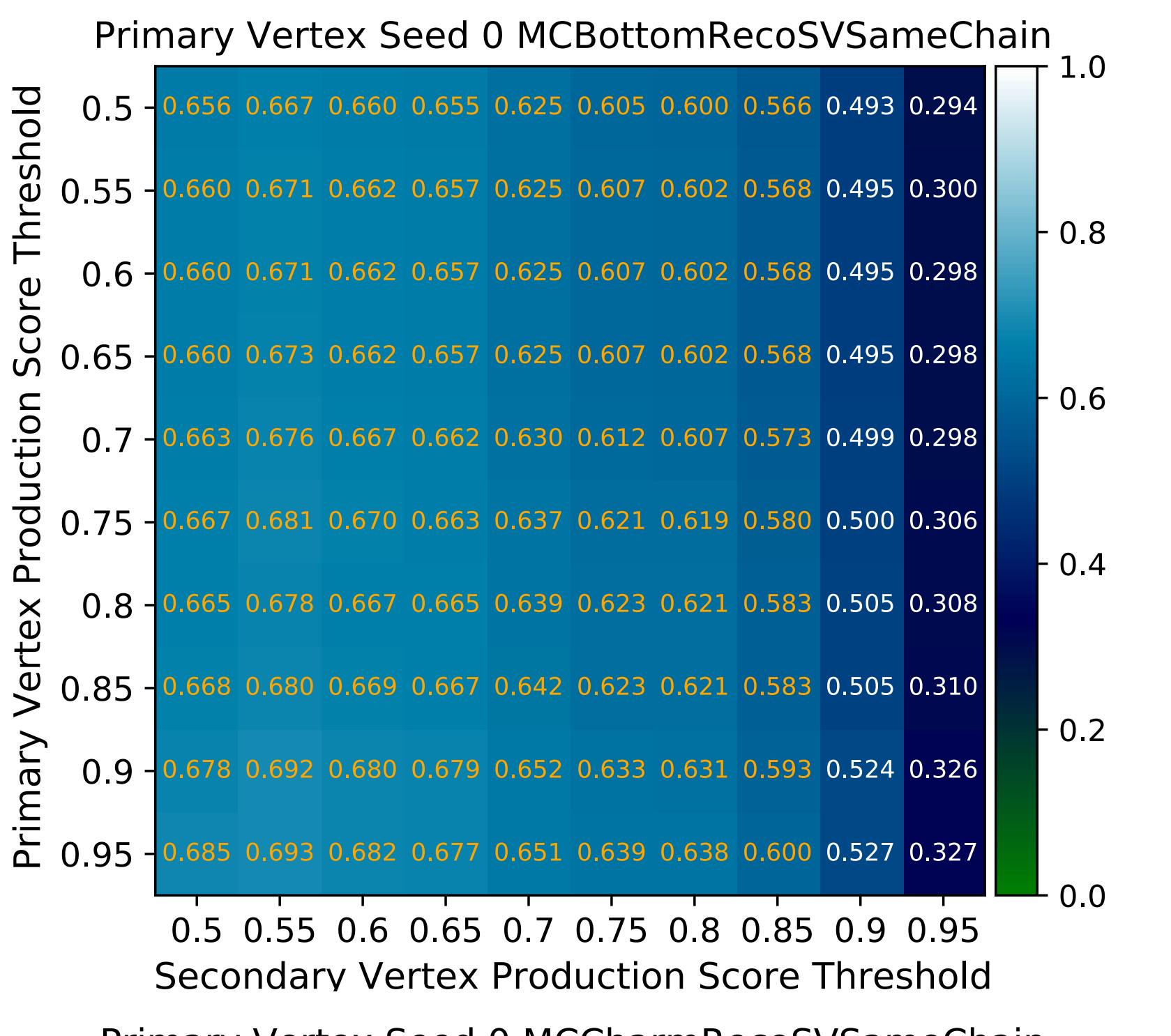
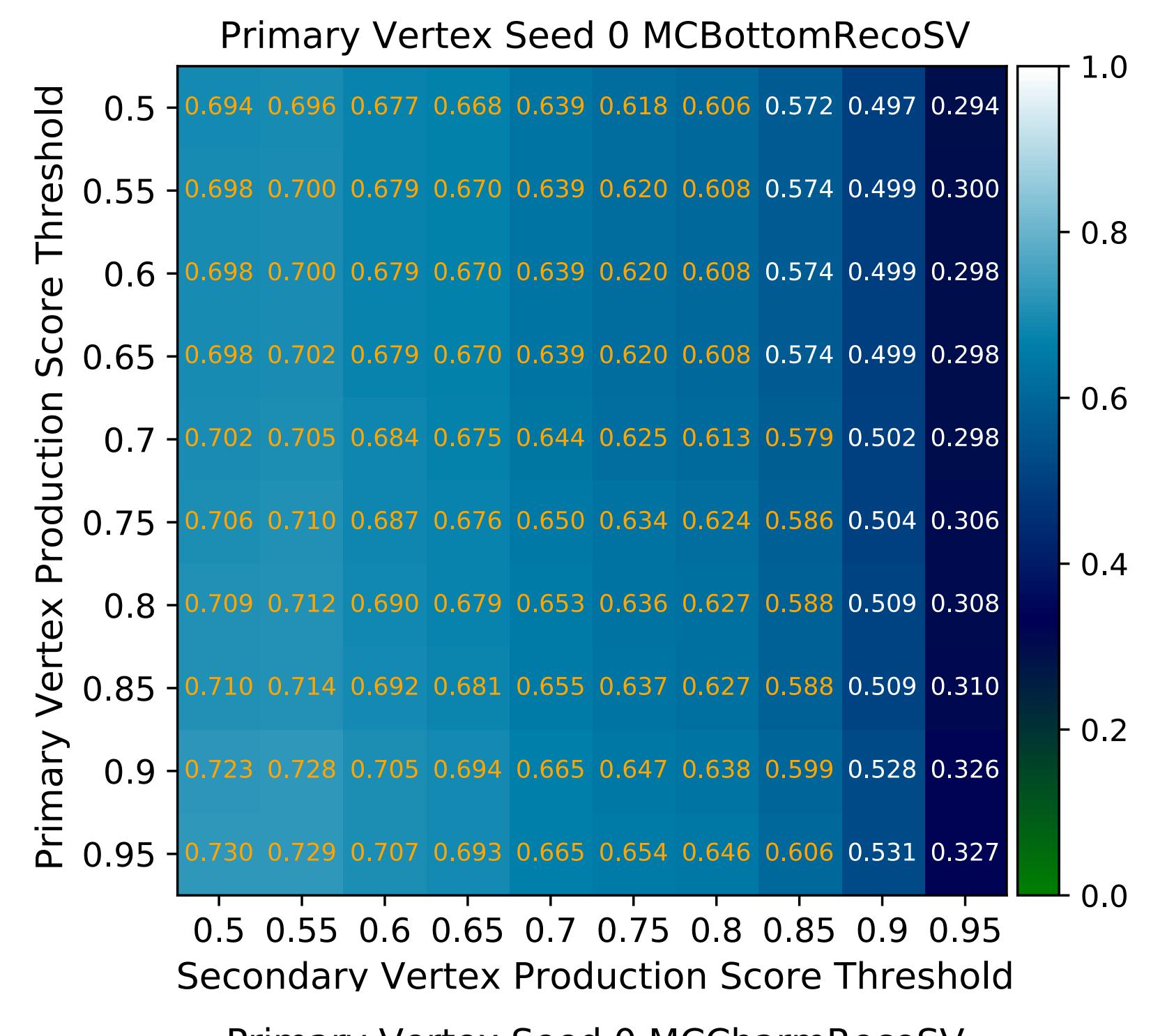


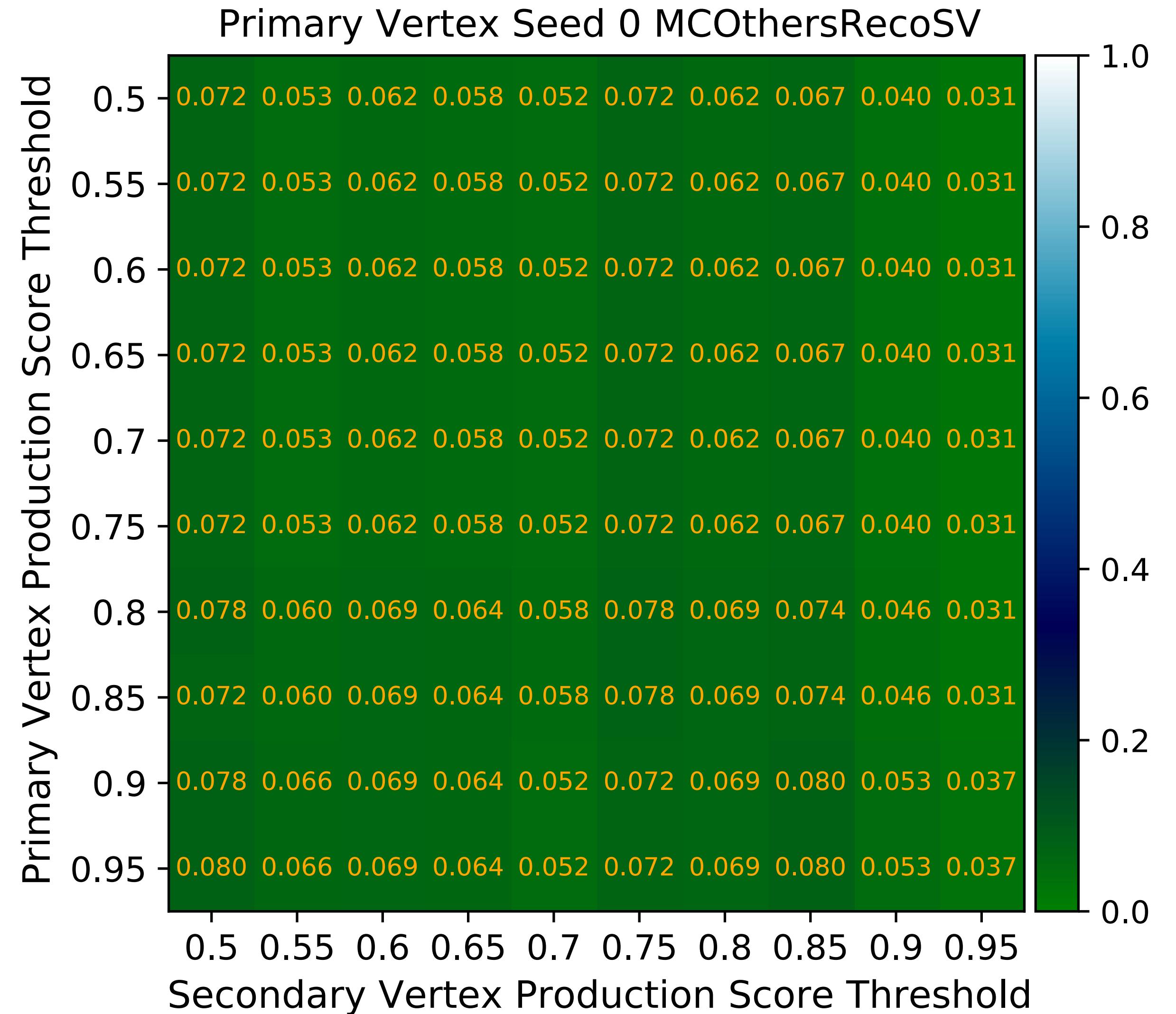
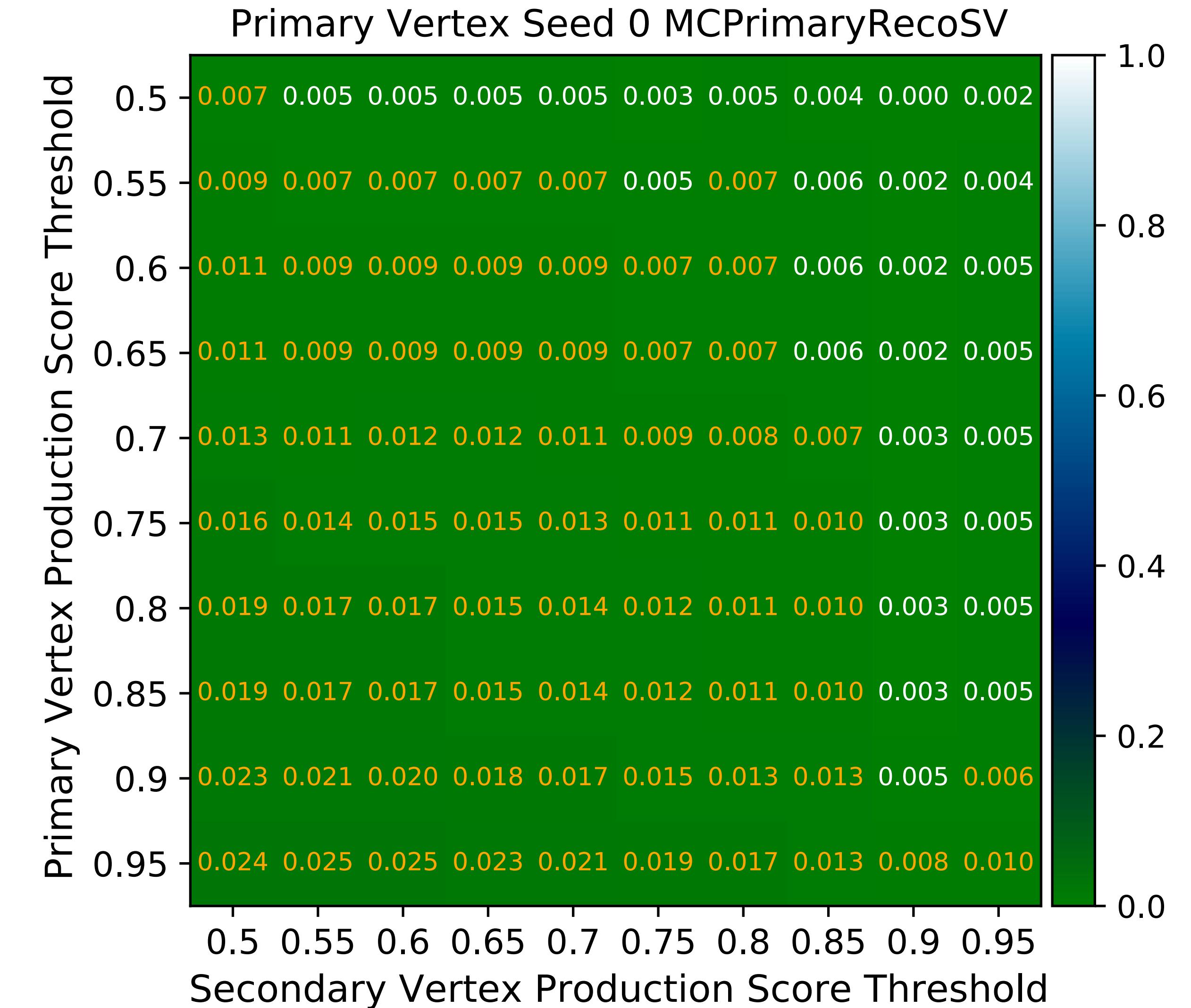


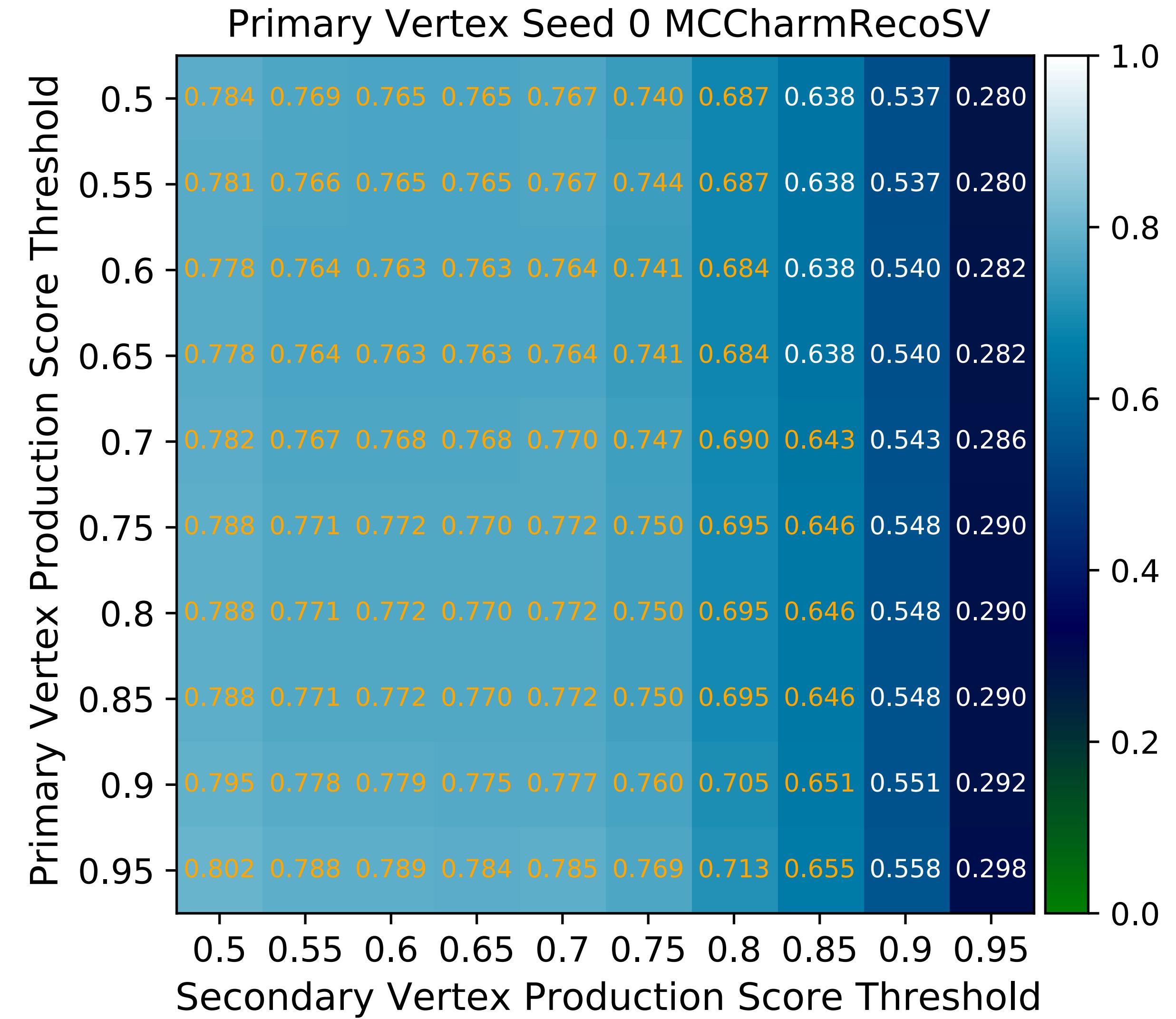
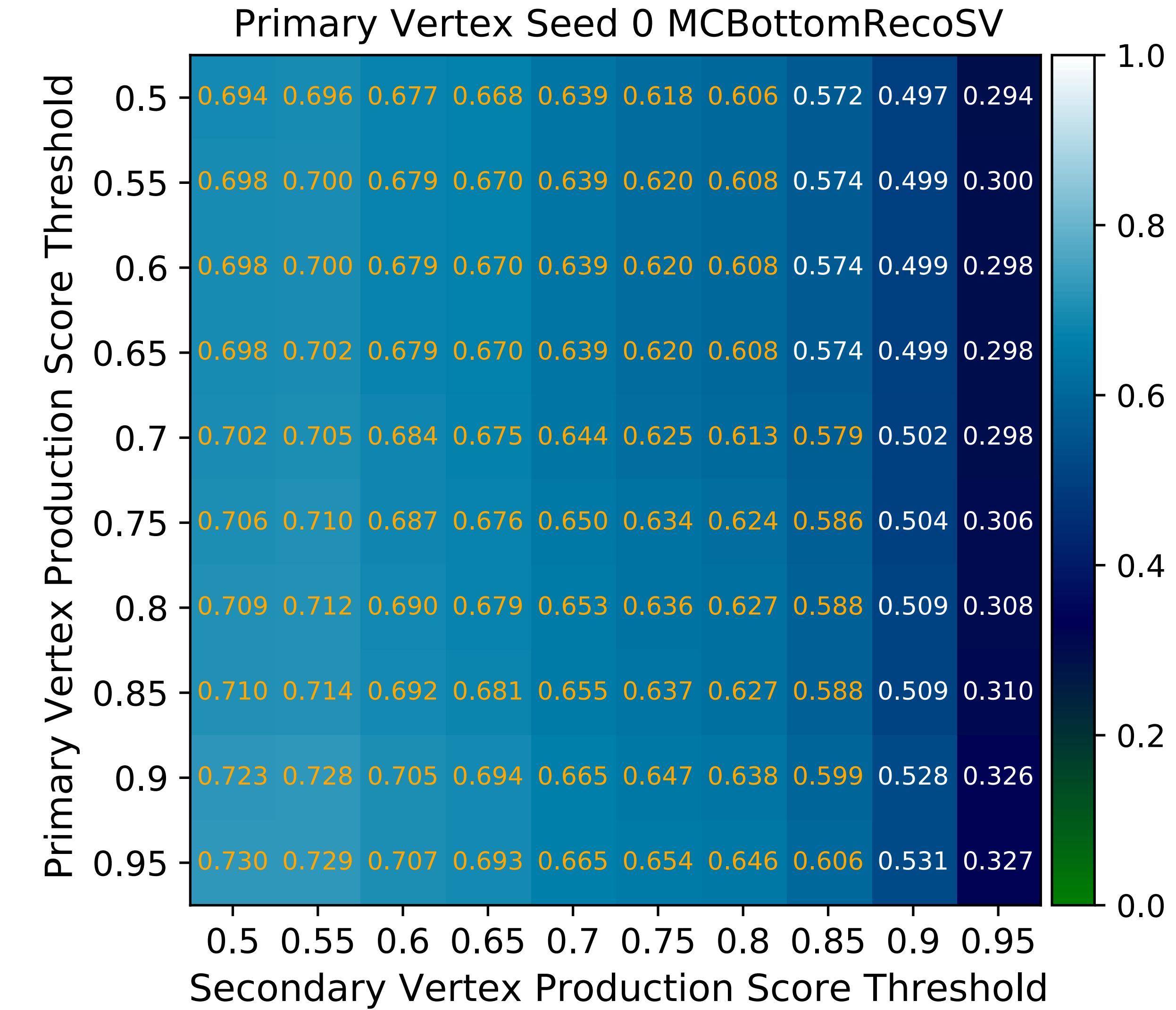


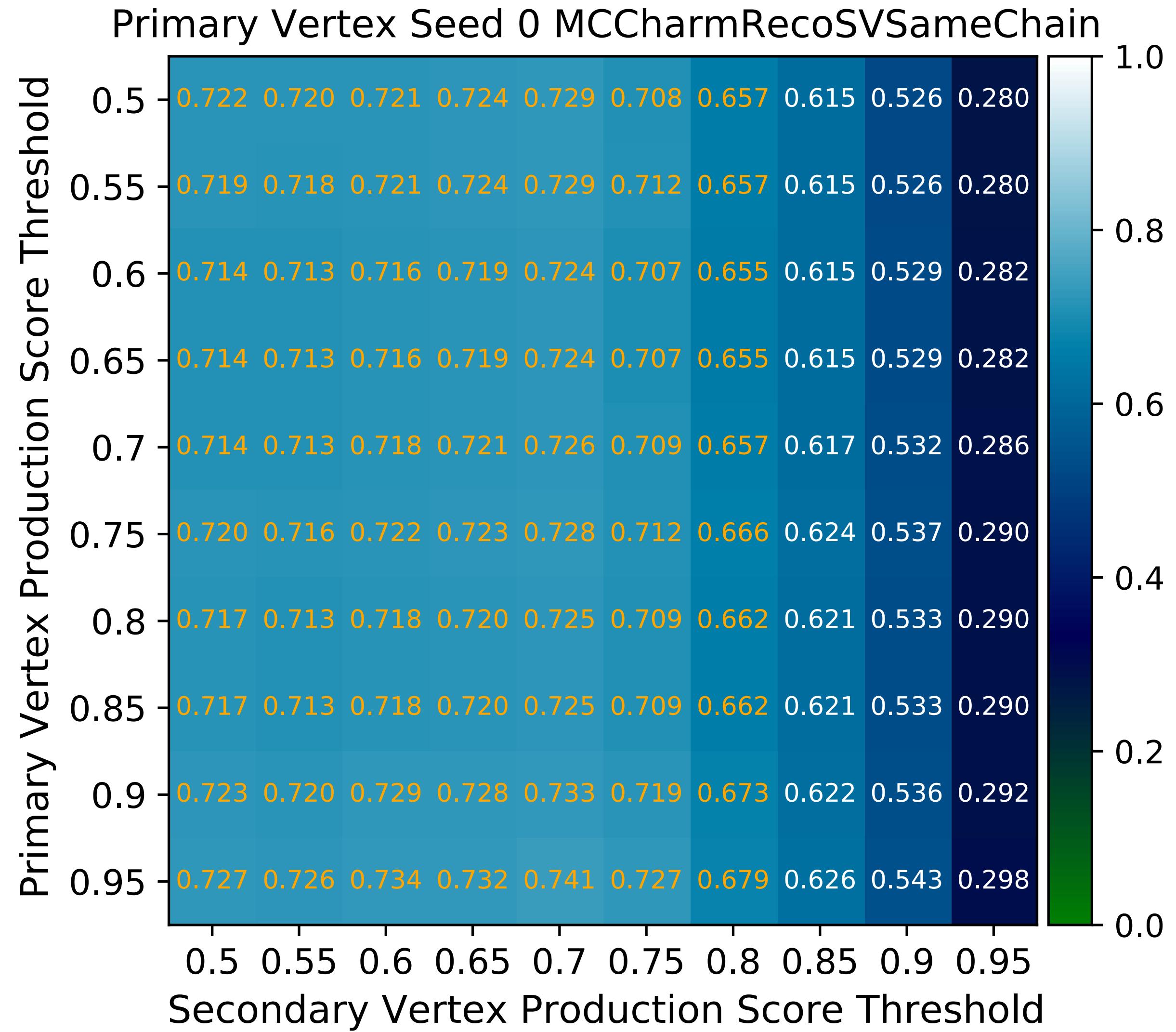
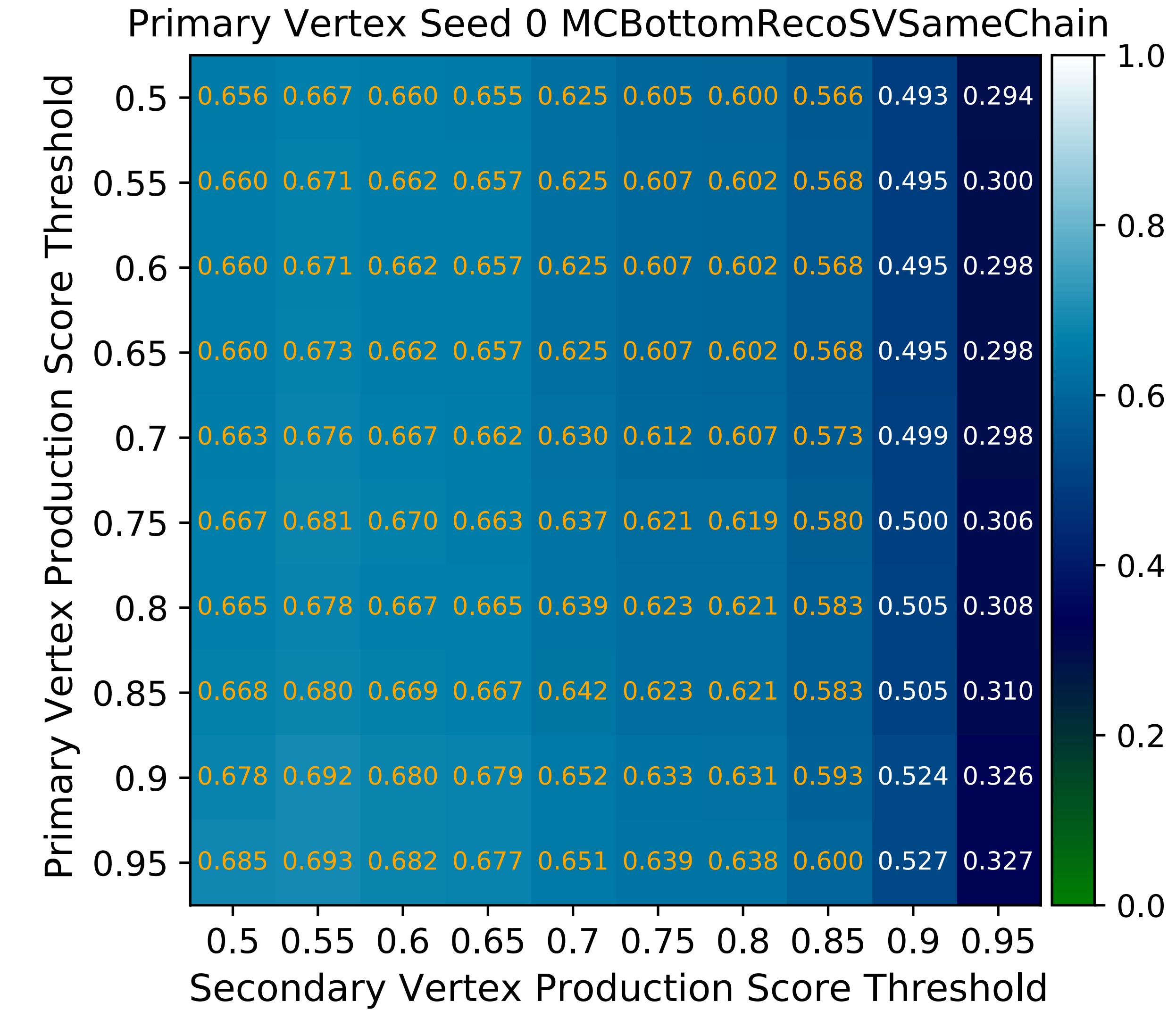
SV Seed Selection PR Curve

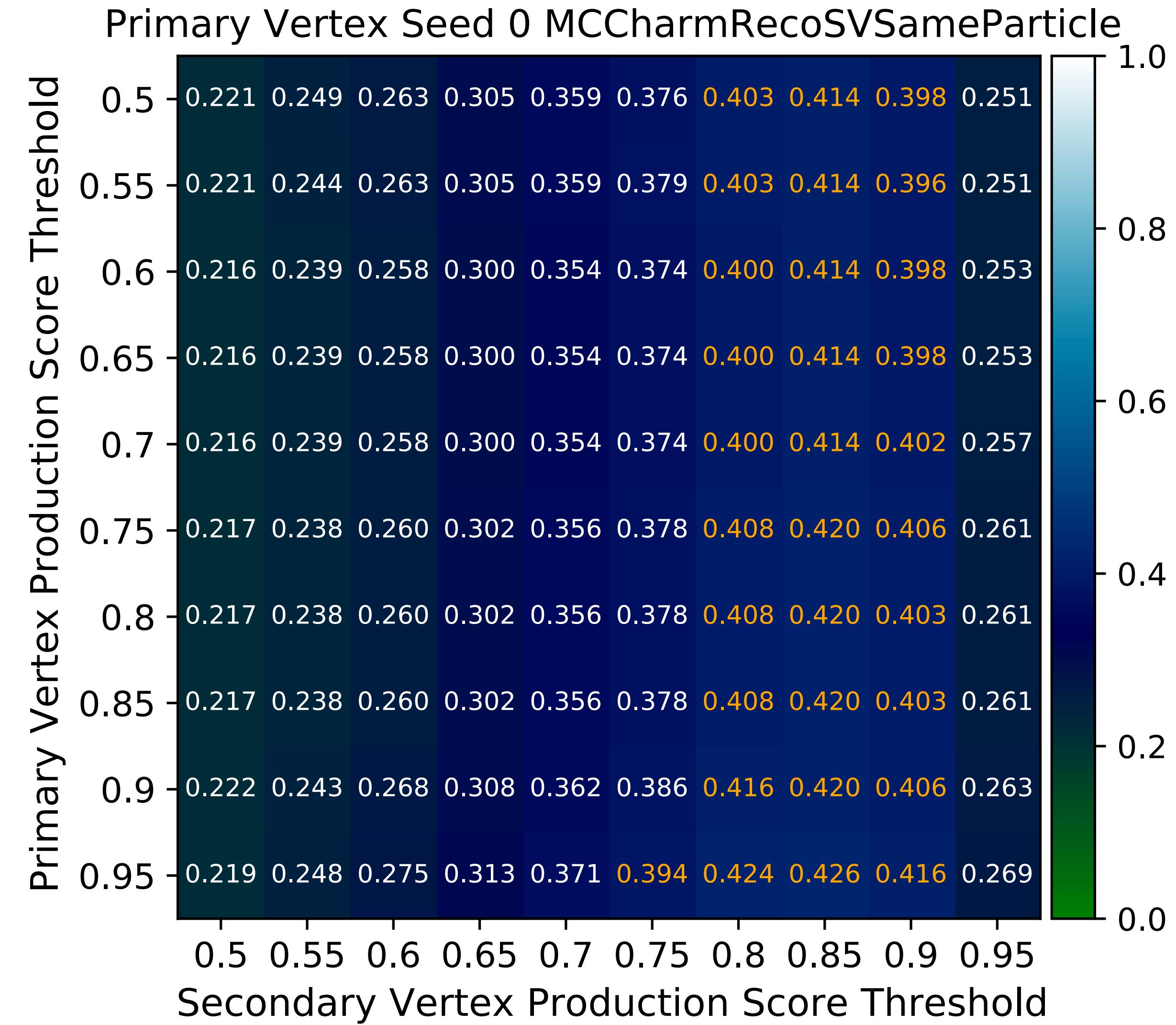
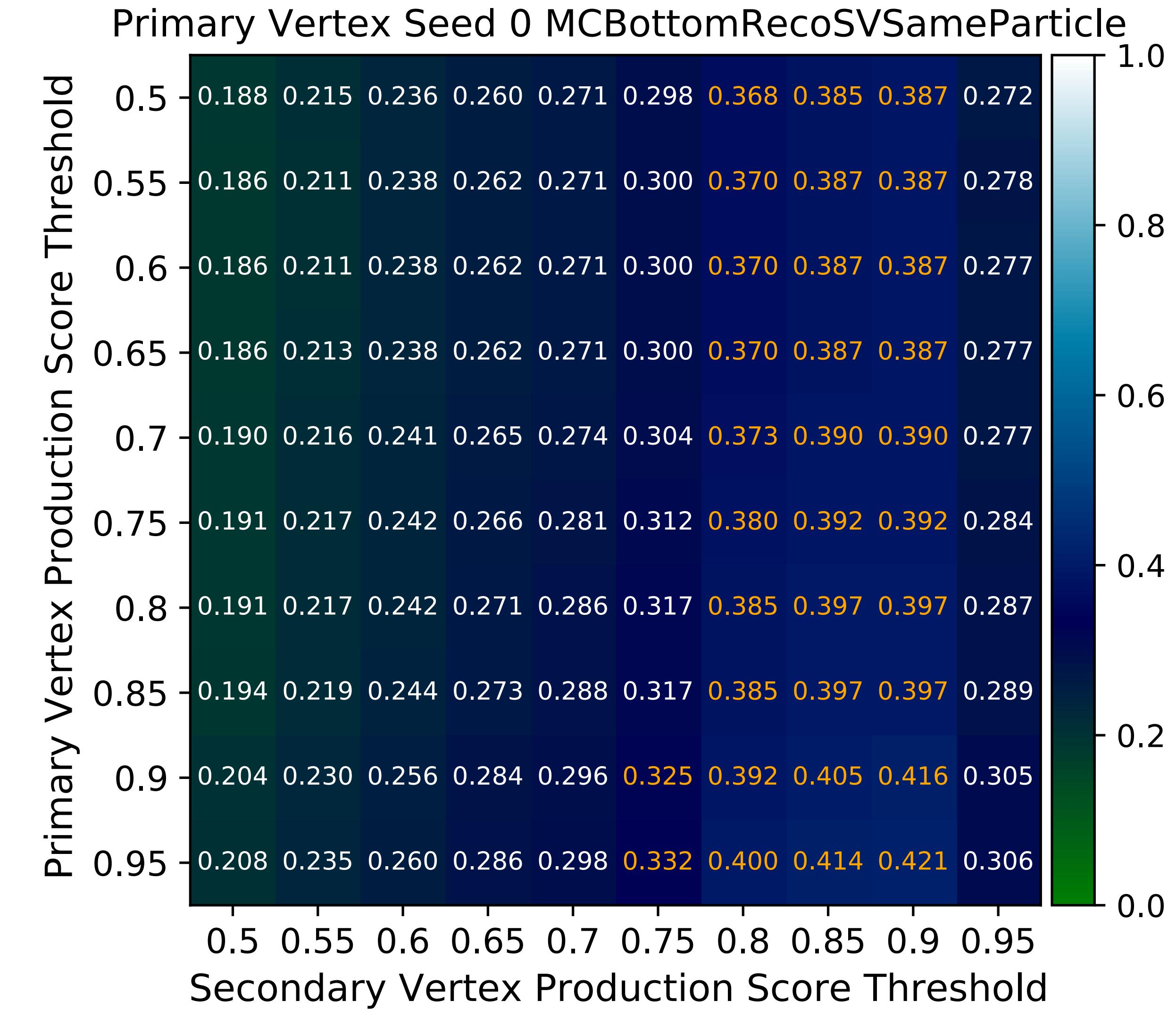


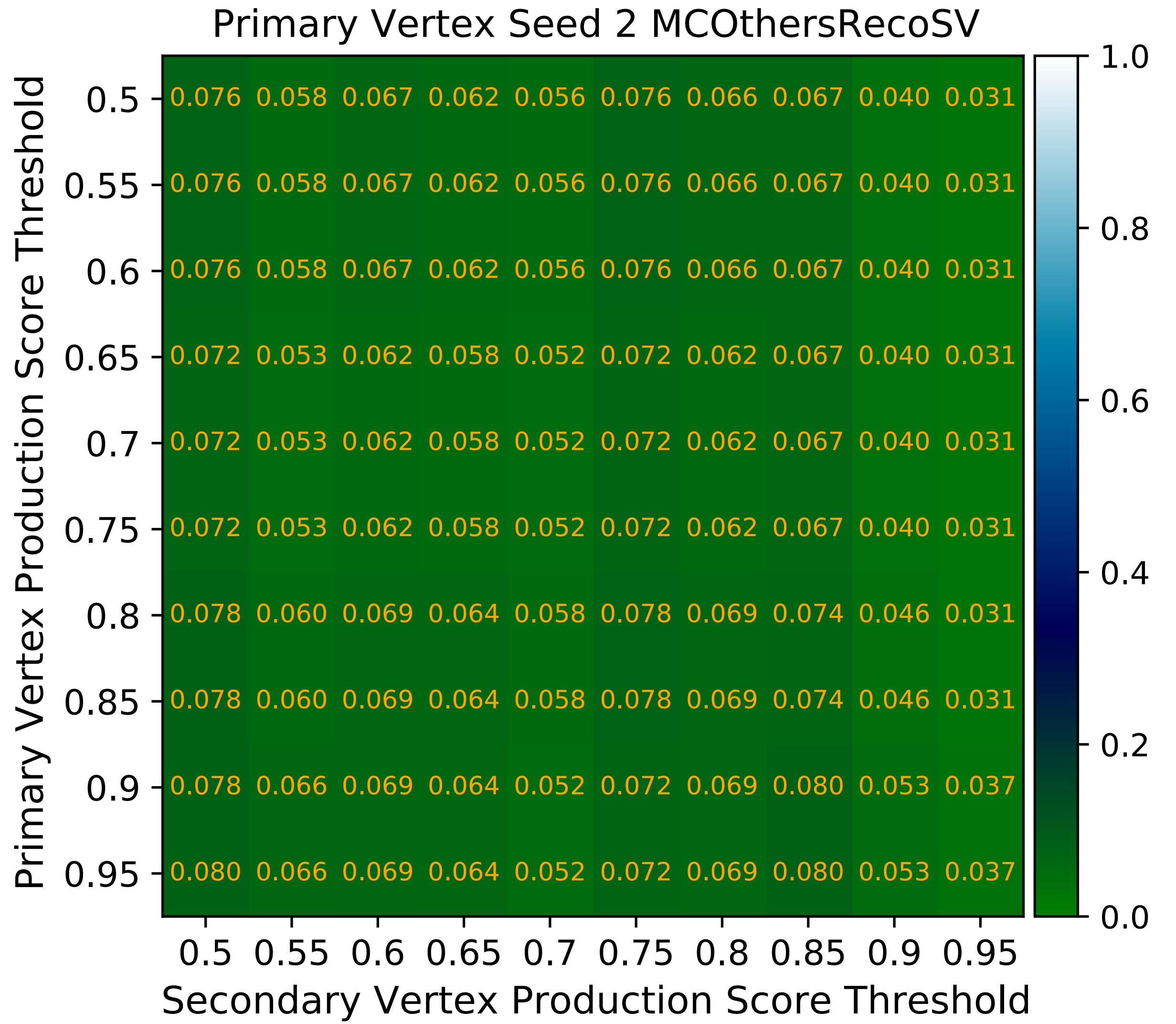
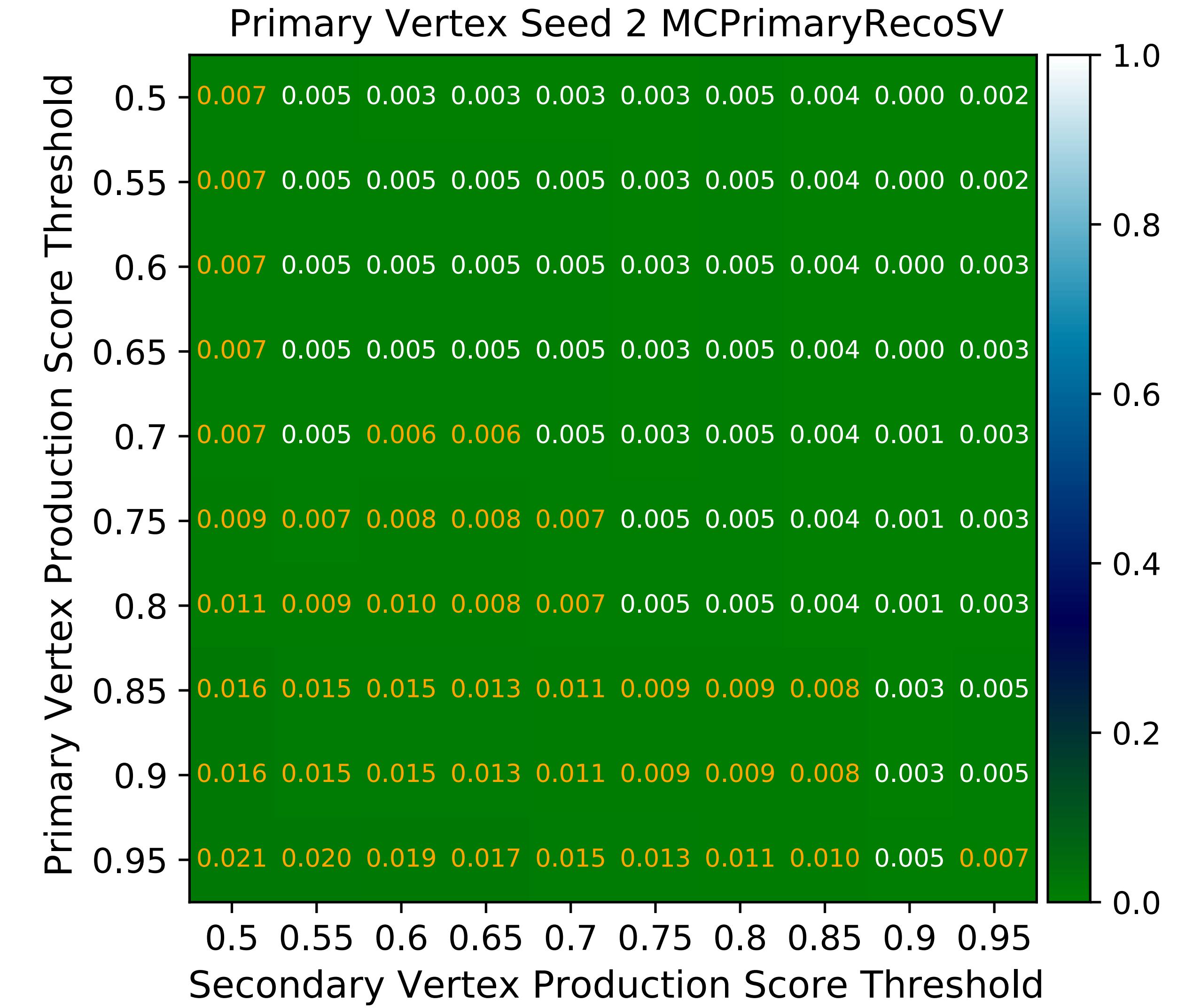


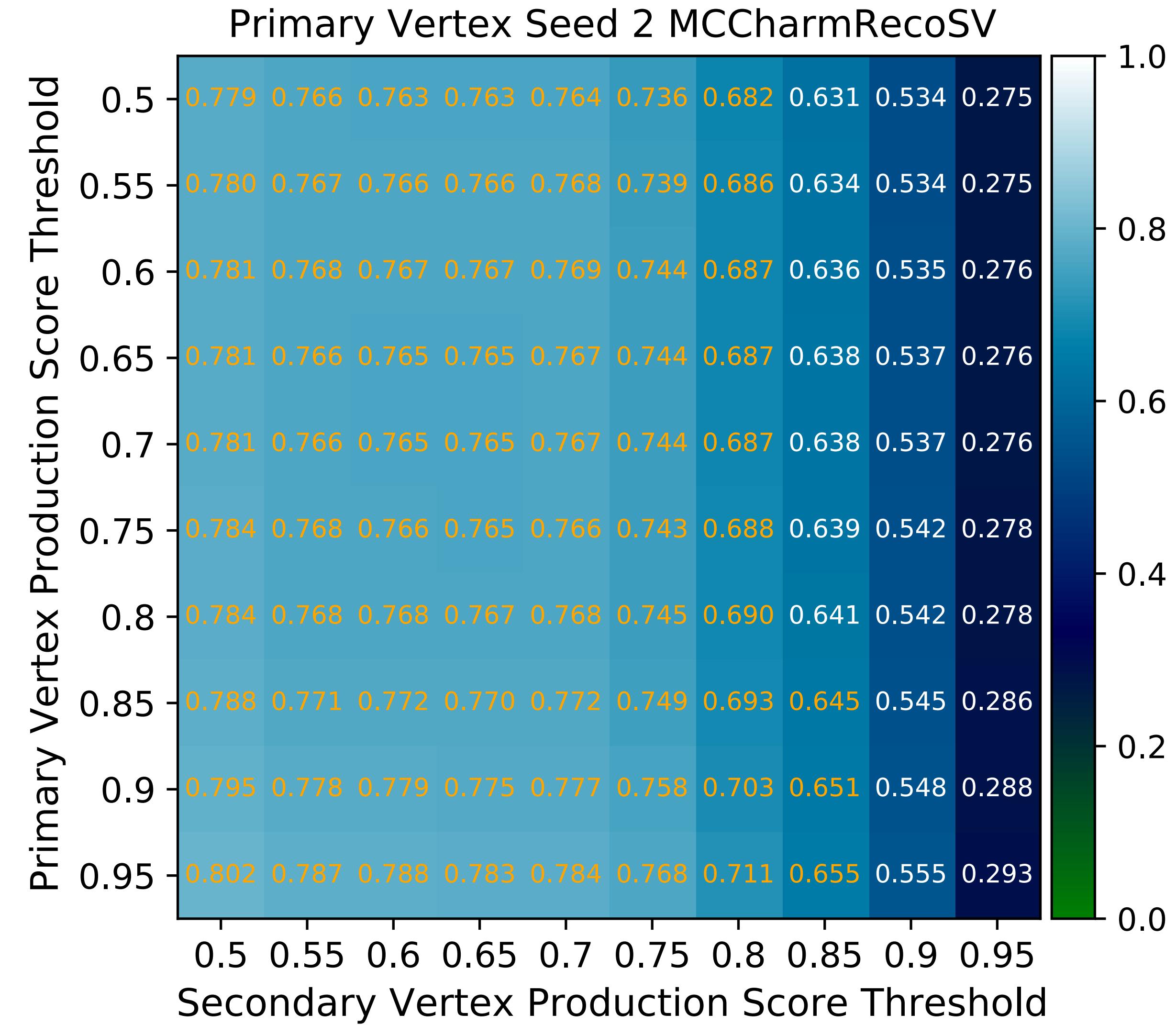
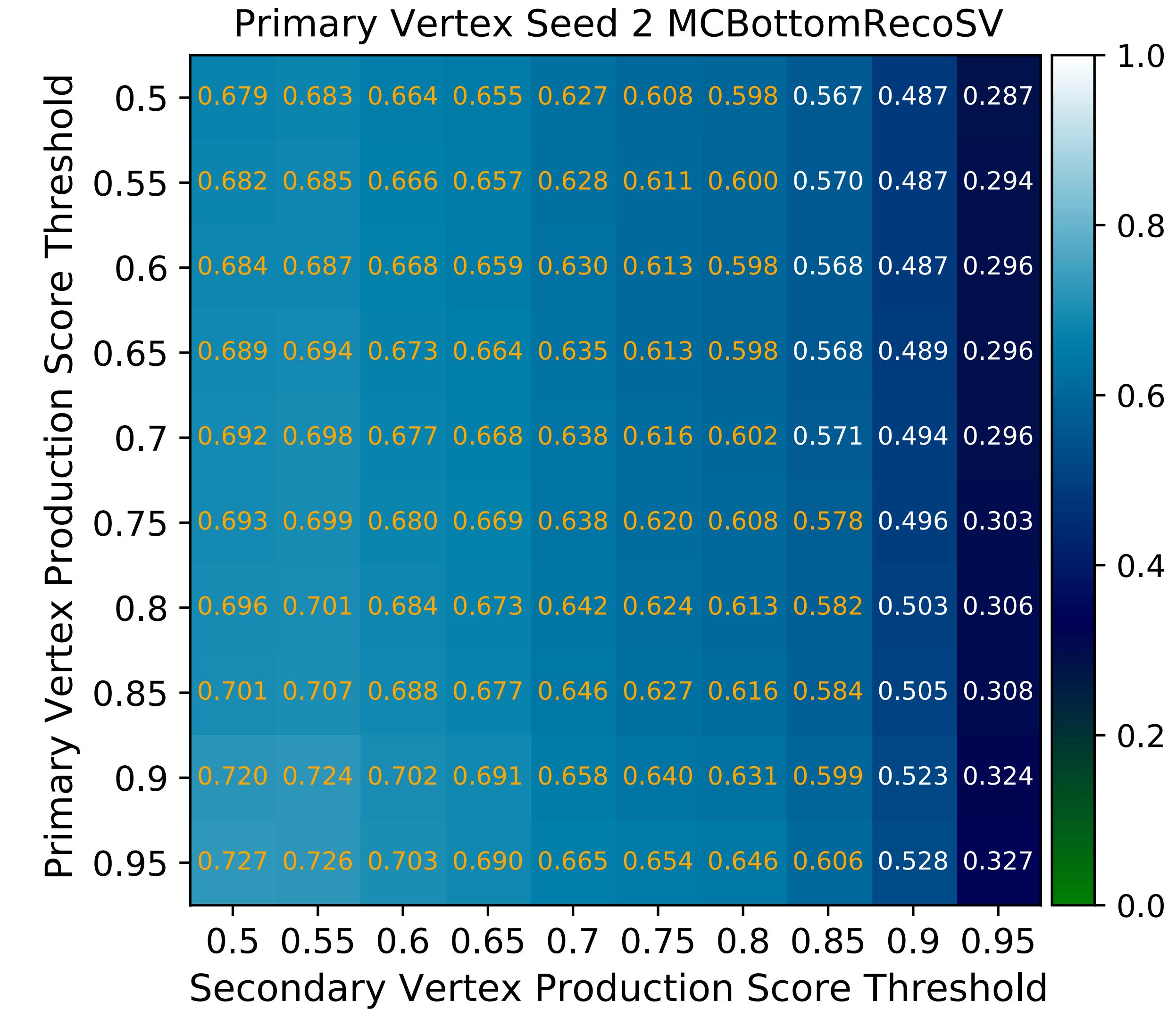


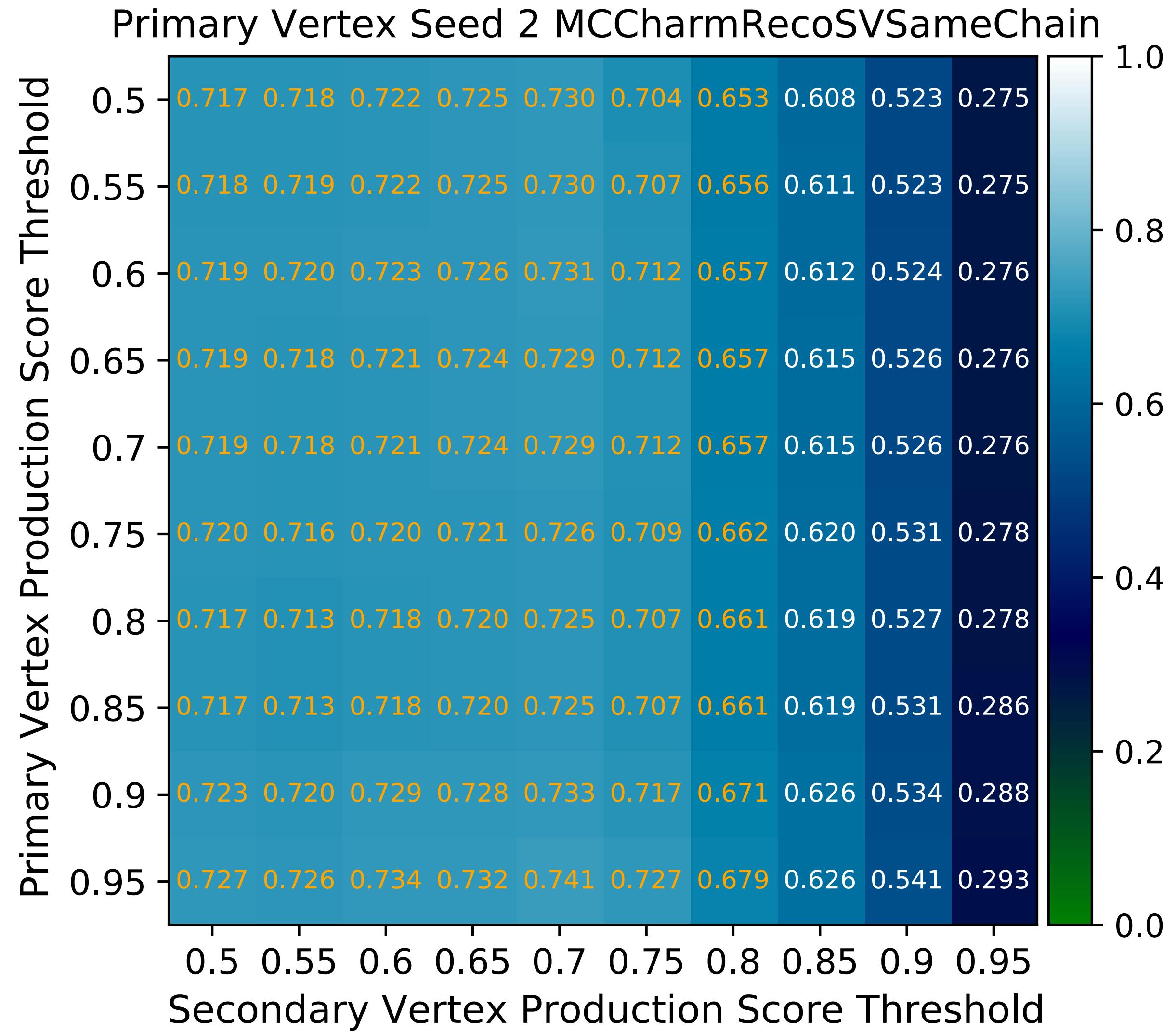
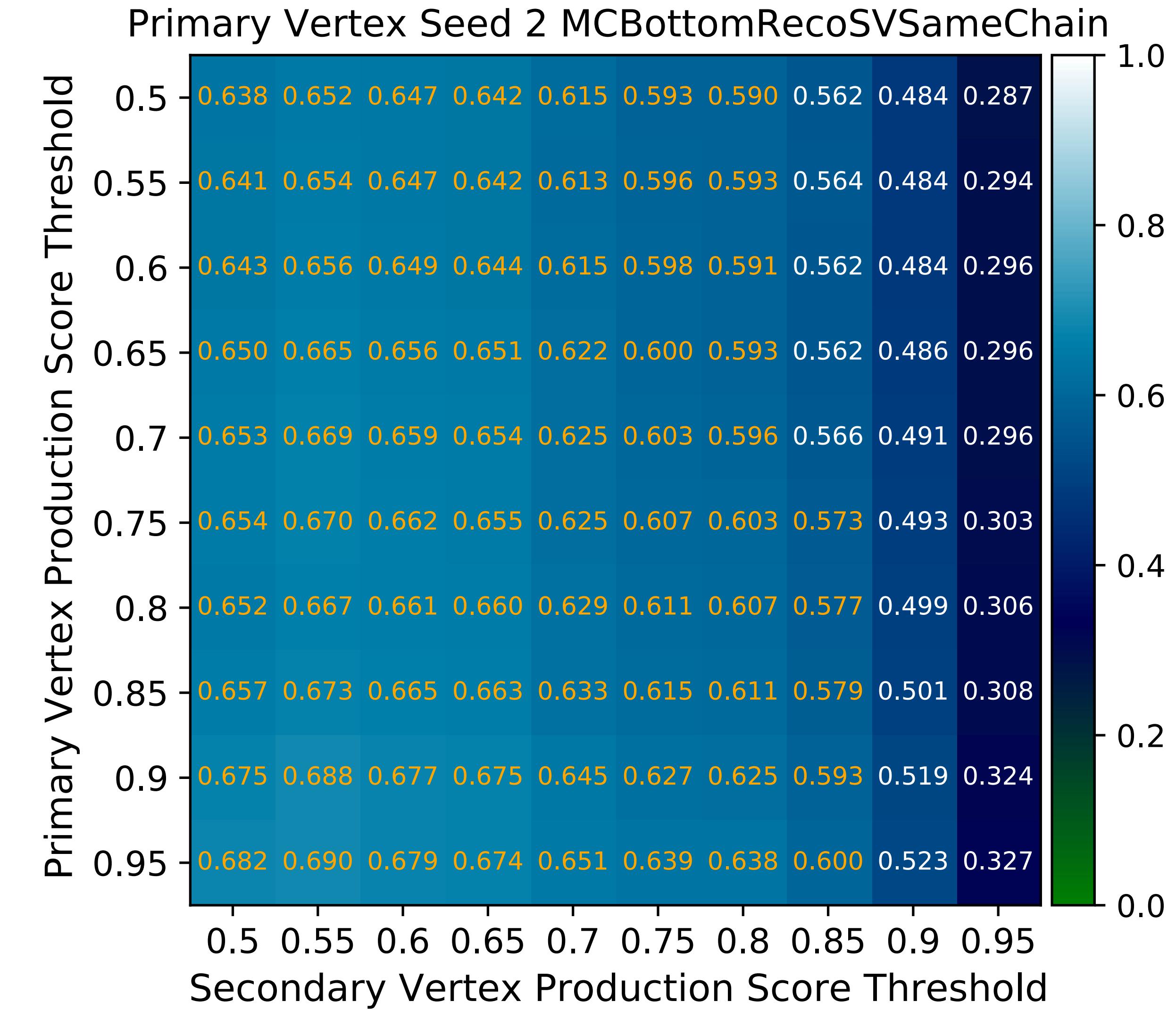


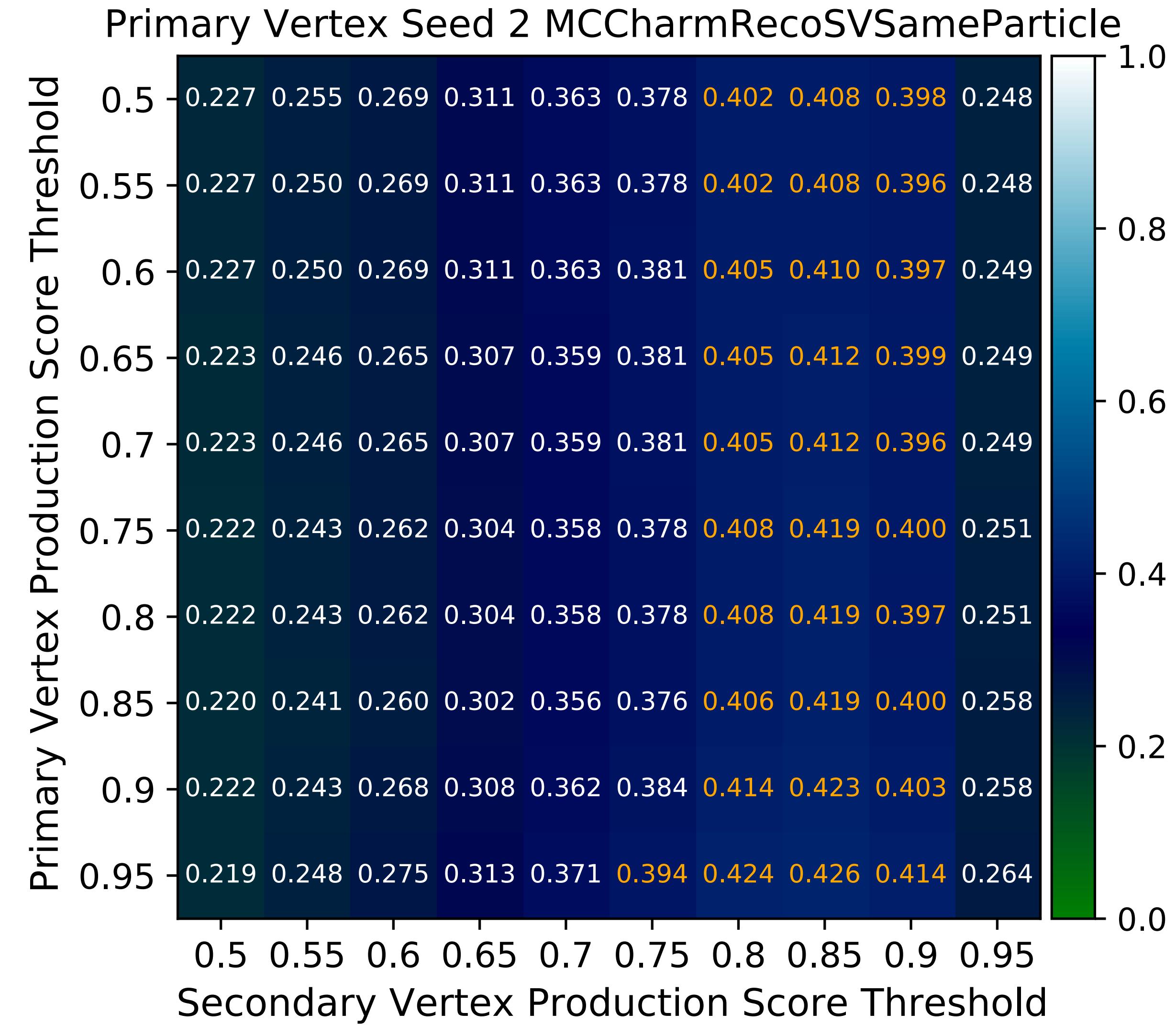
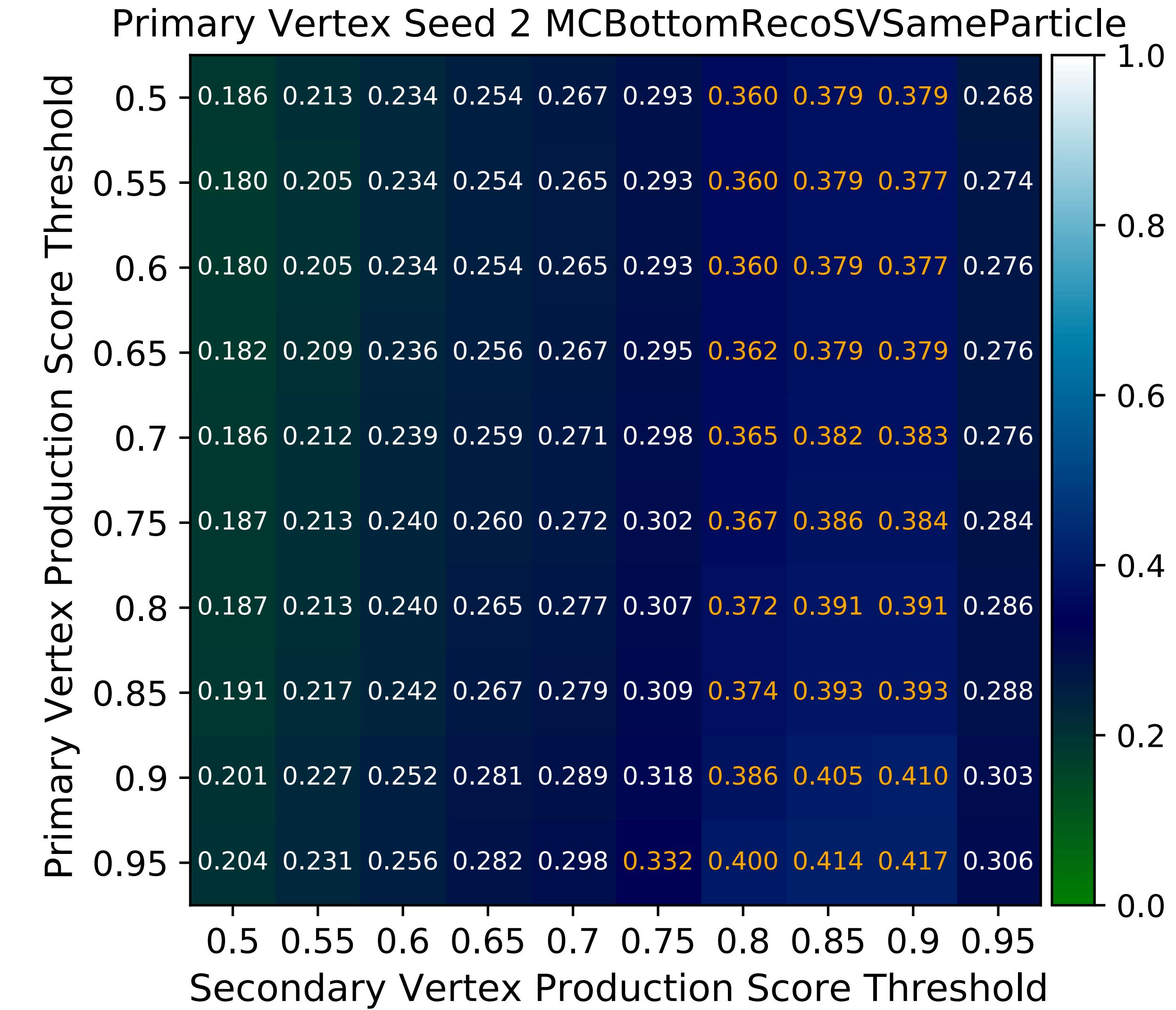




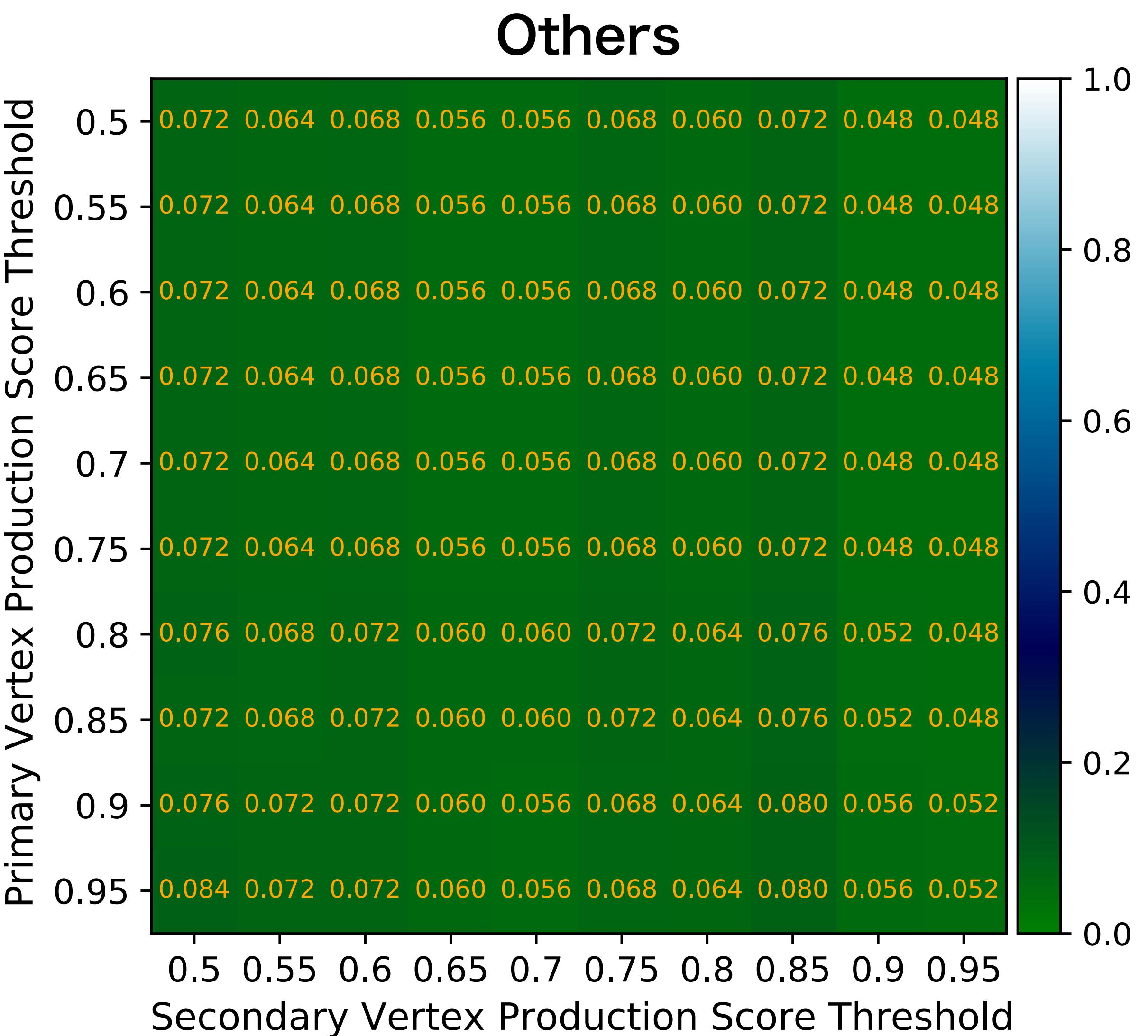
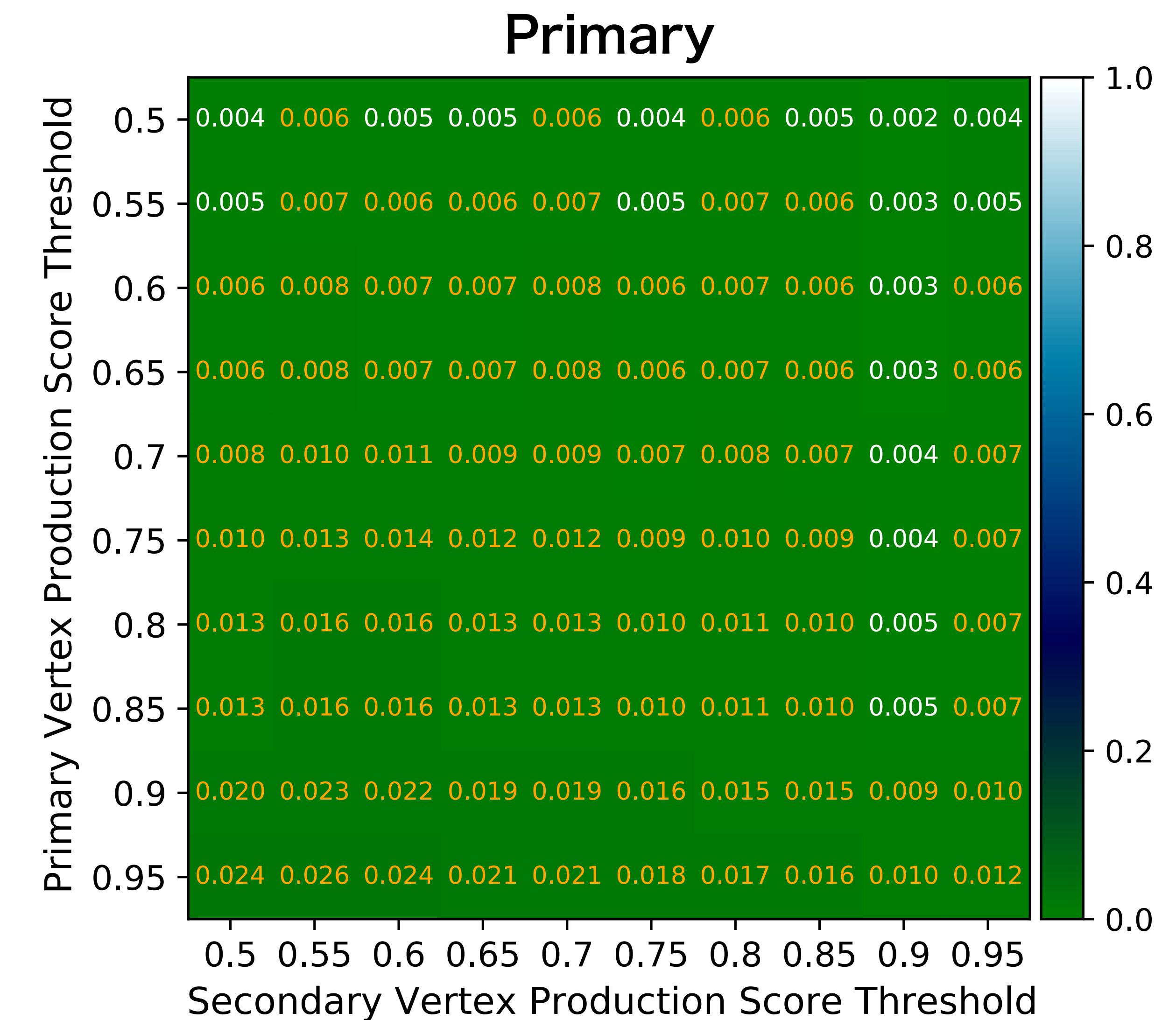




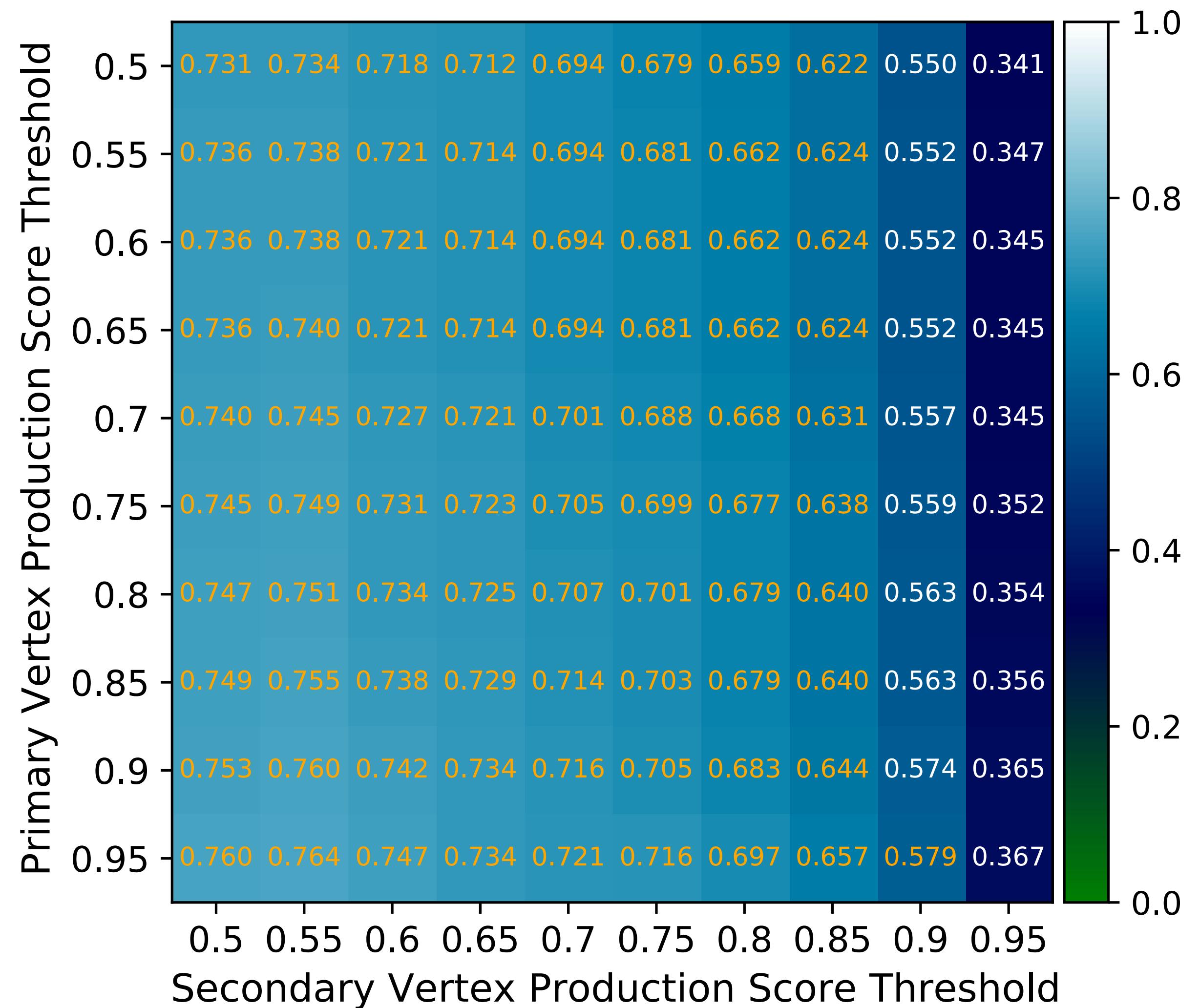




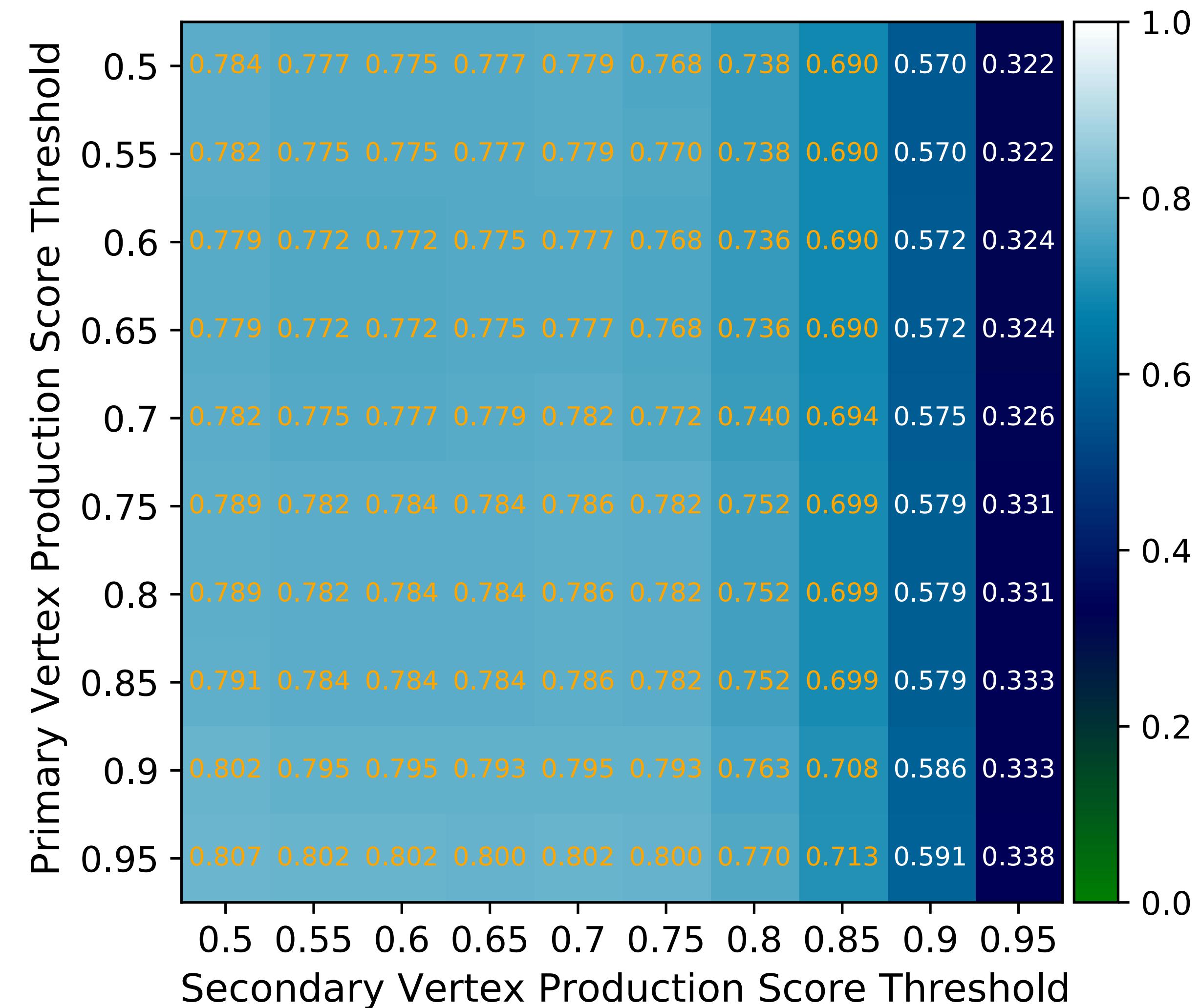
Track base



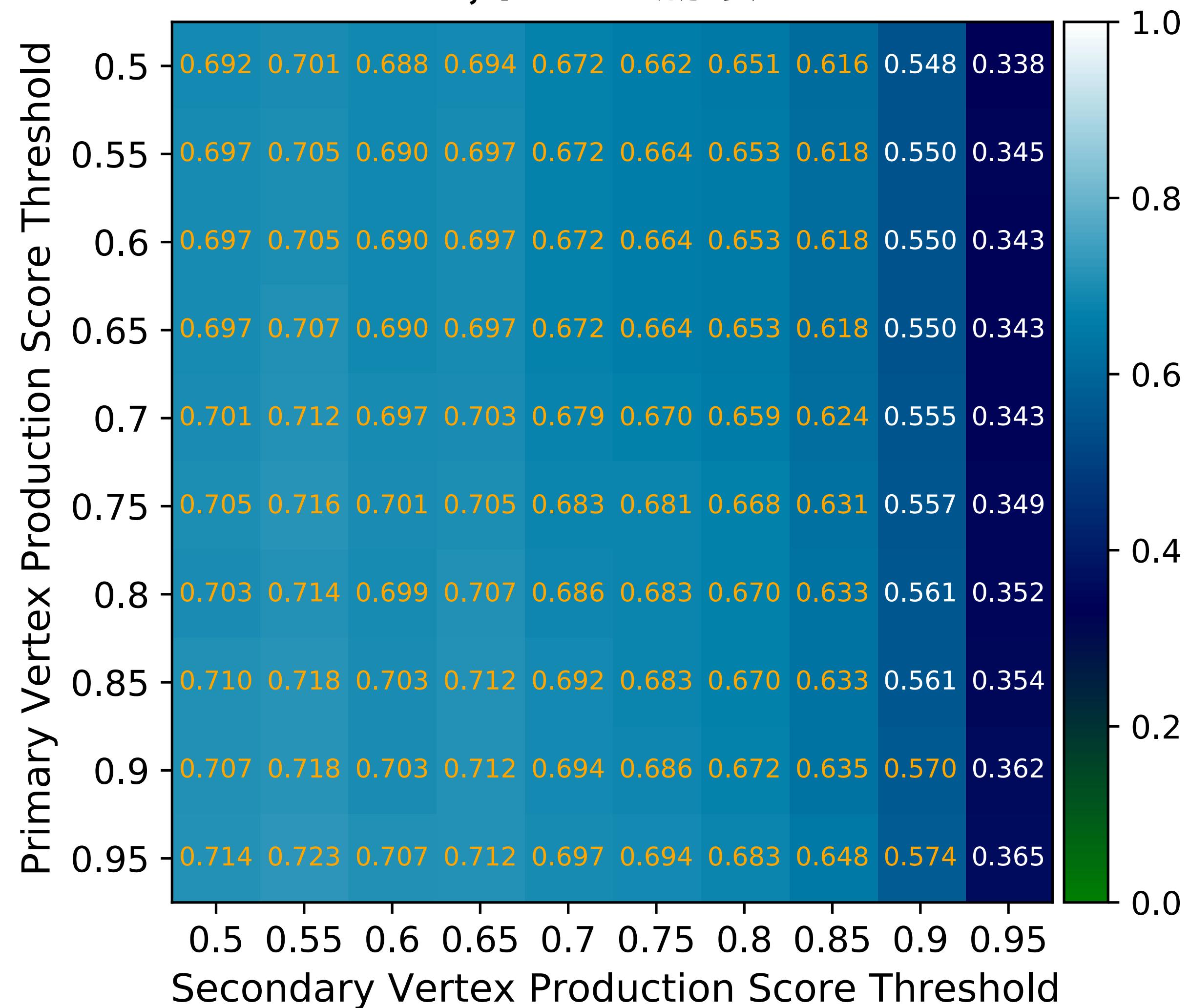
Bottom



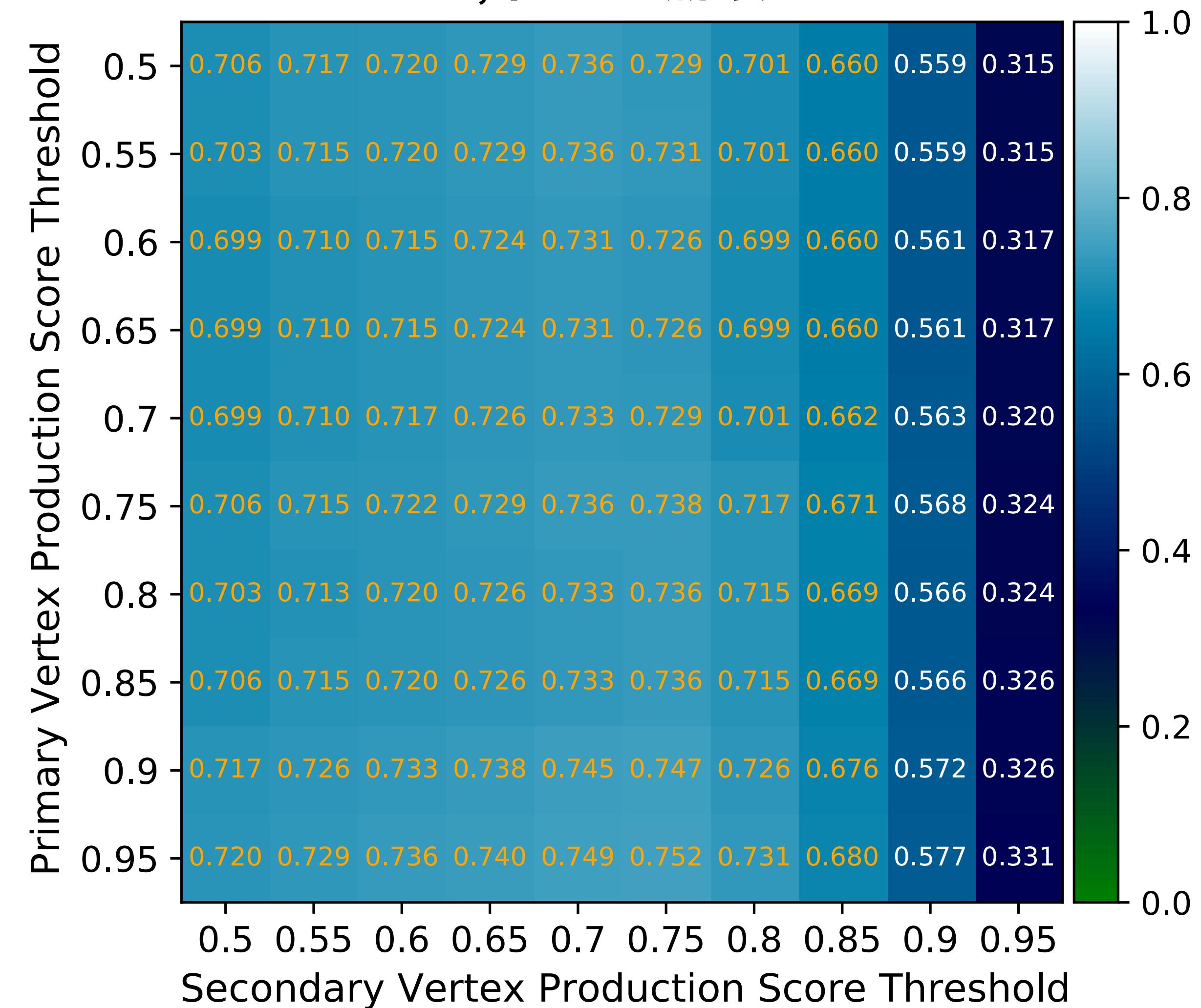
Charm



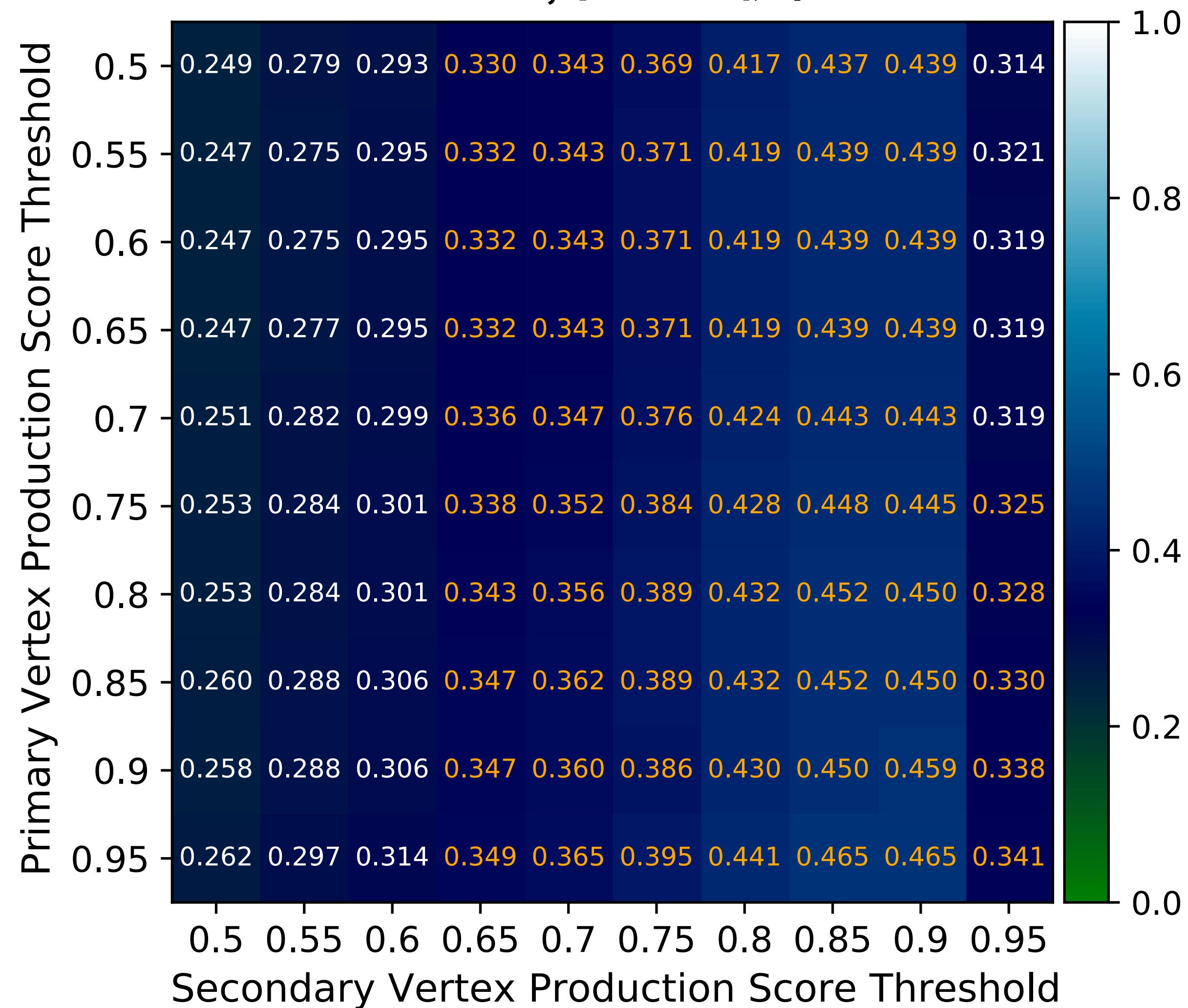
Bottom, 同一の崩壊チェイン



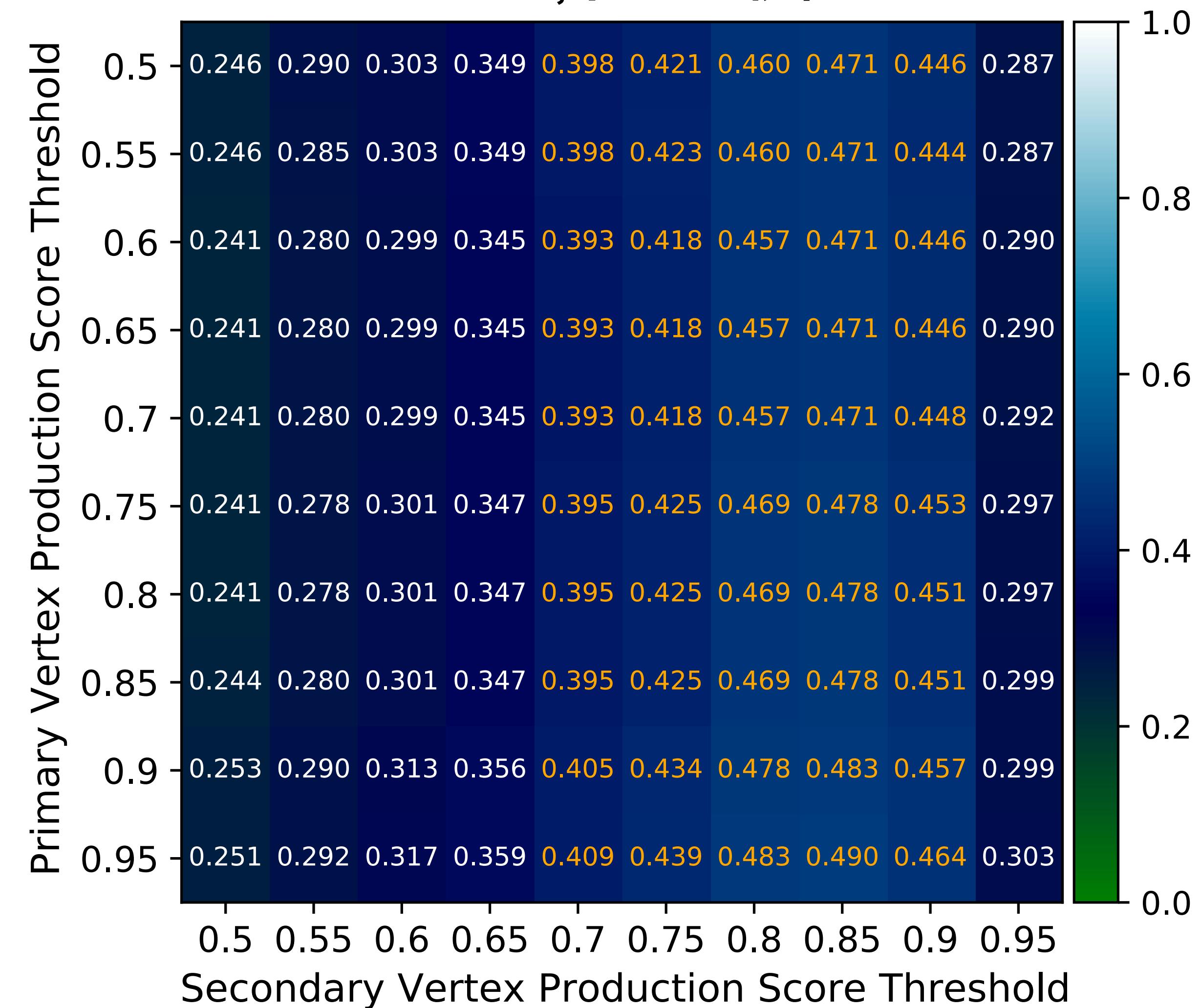
Charm, 同一の崩壊チェイン

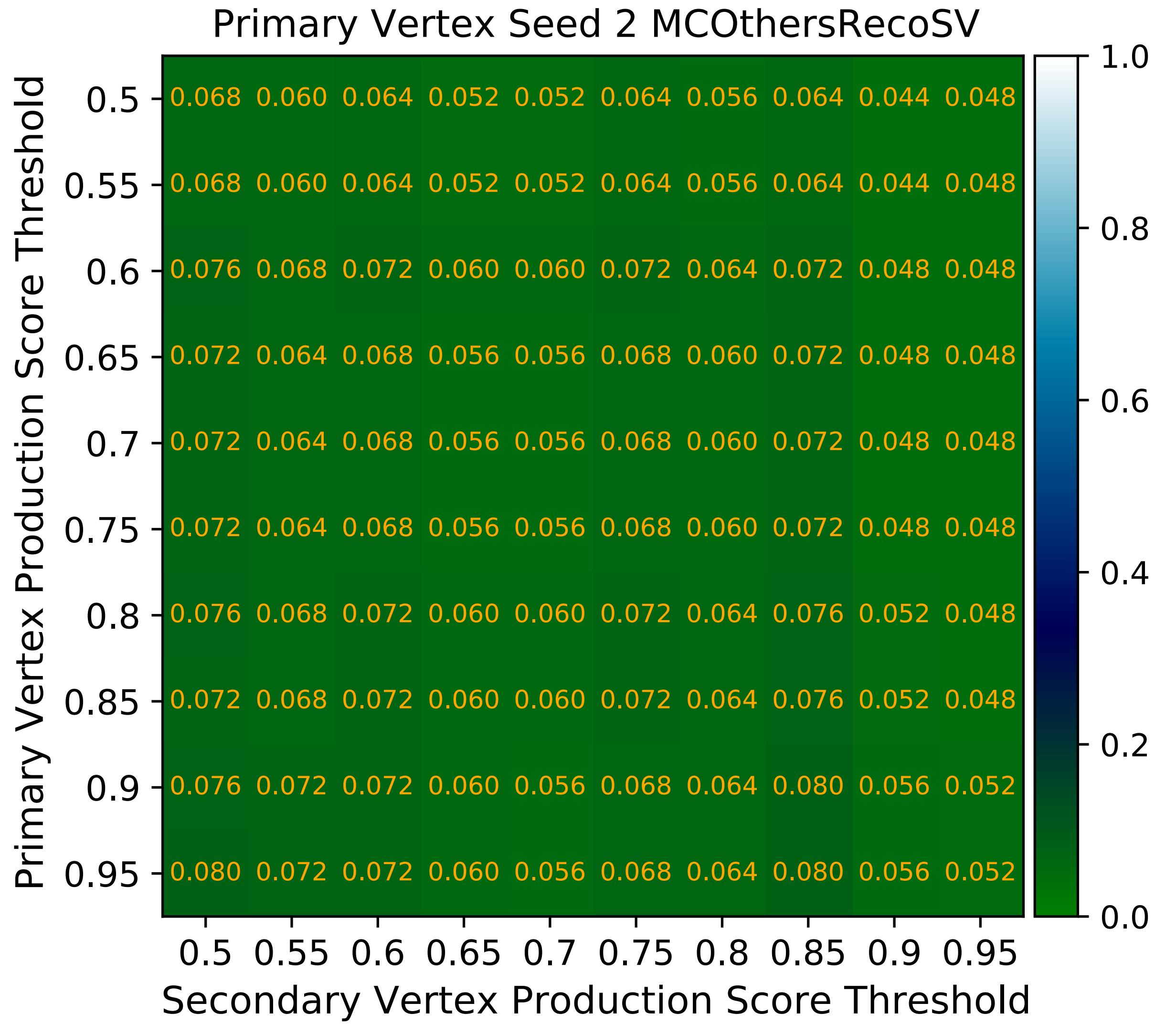
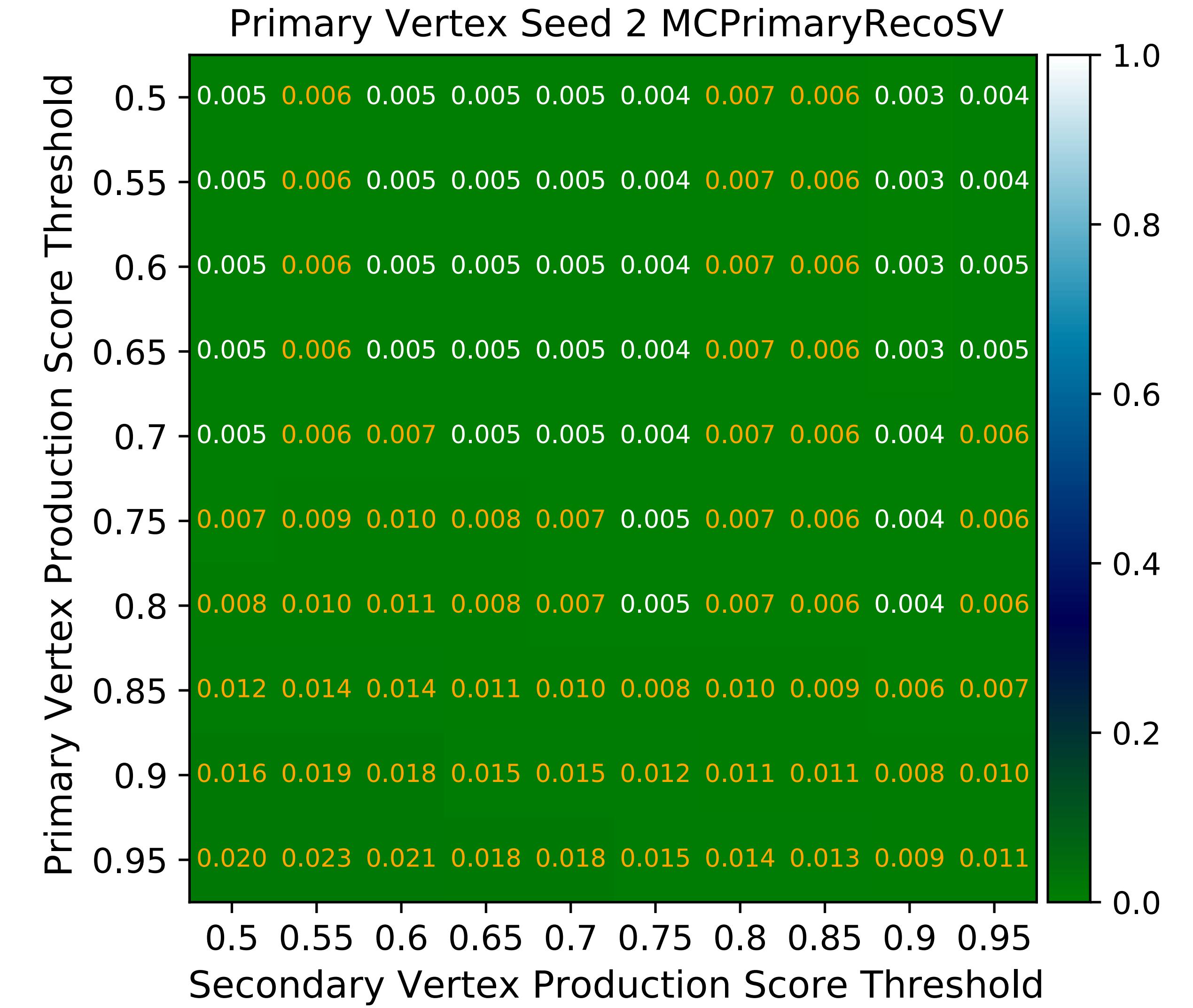


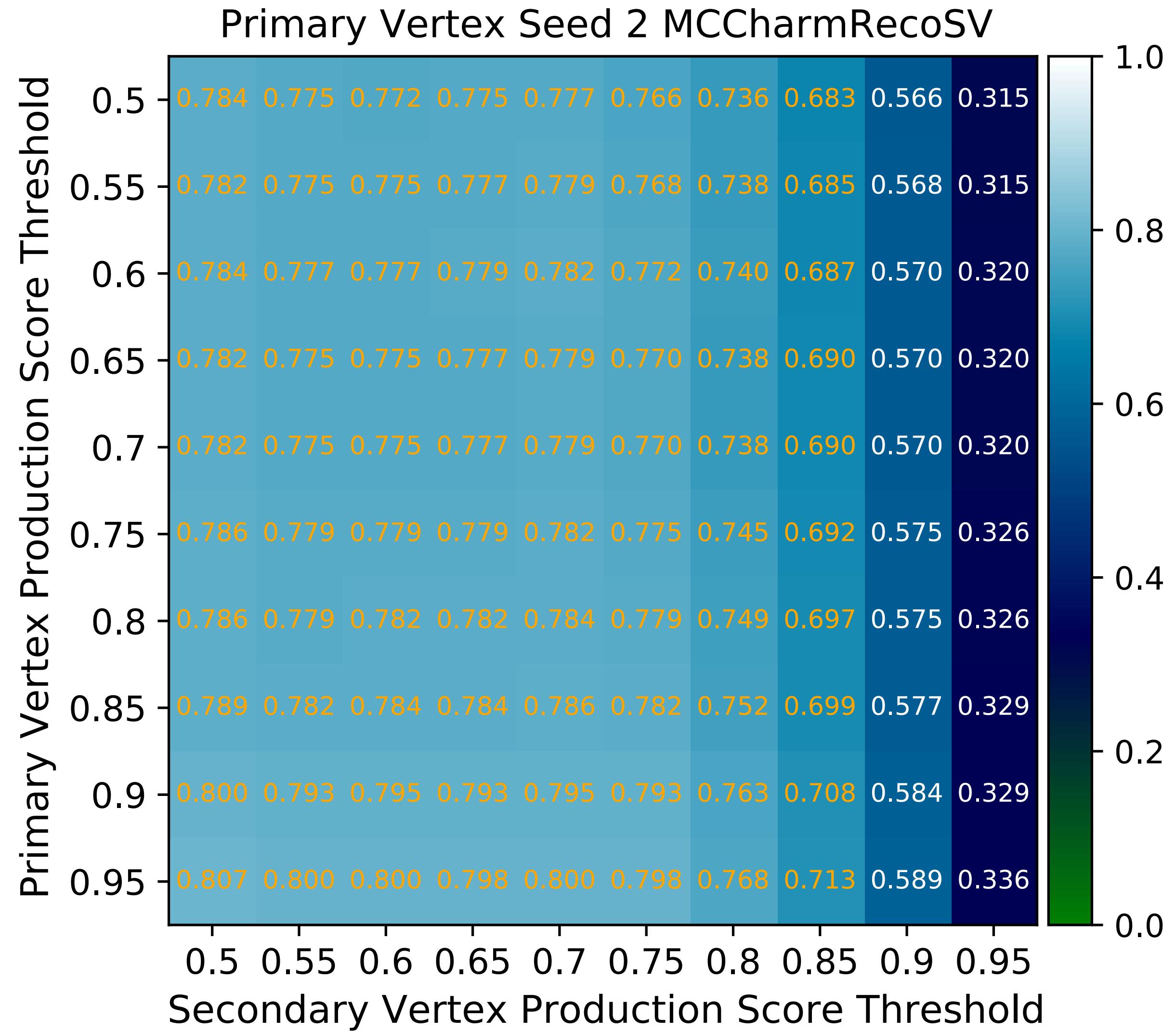
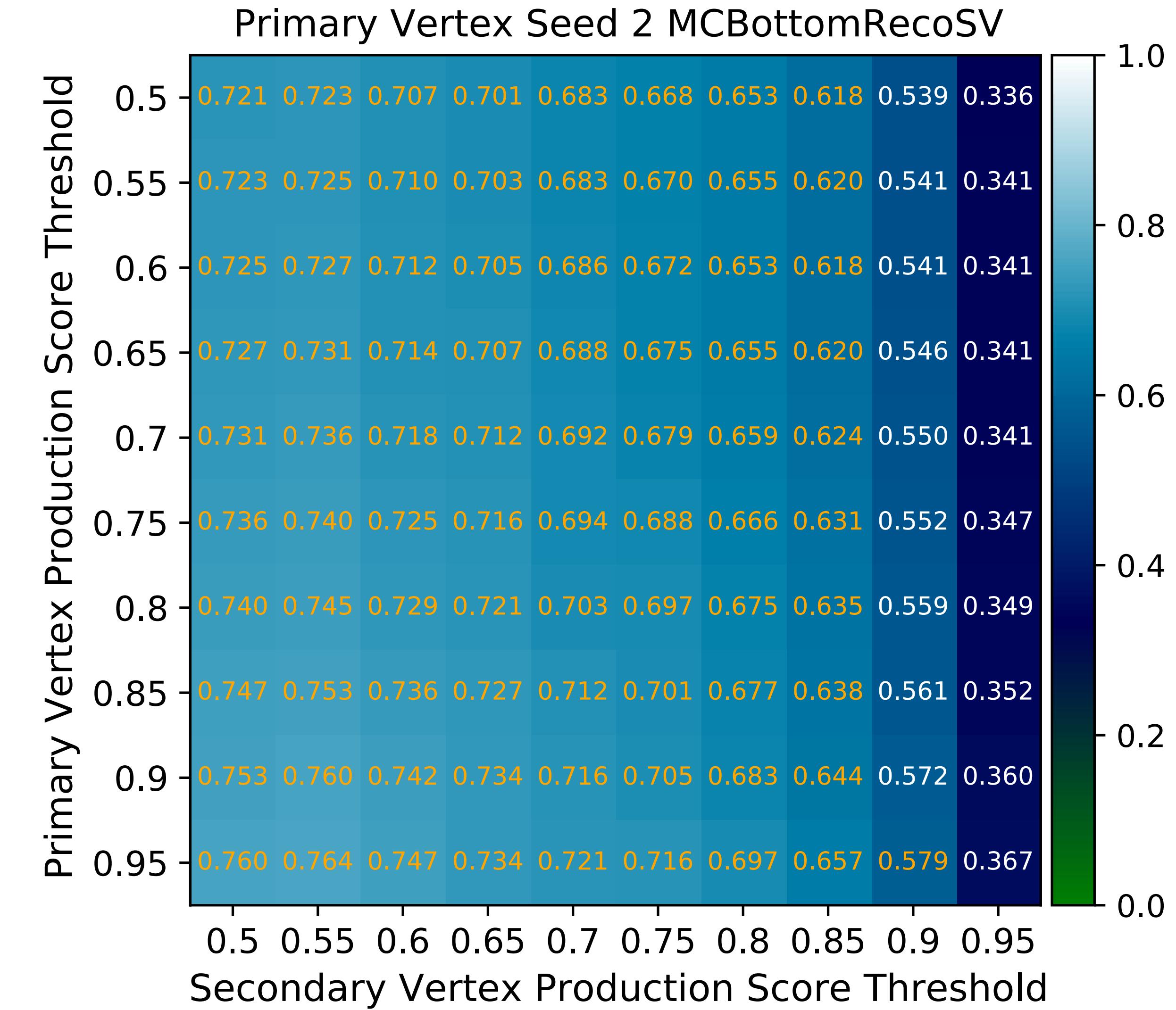
Bottom, 同一の親粒子

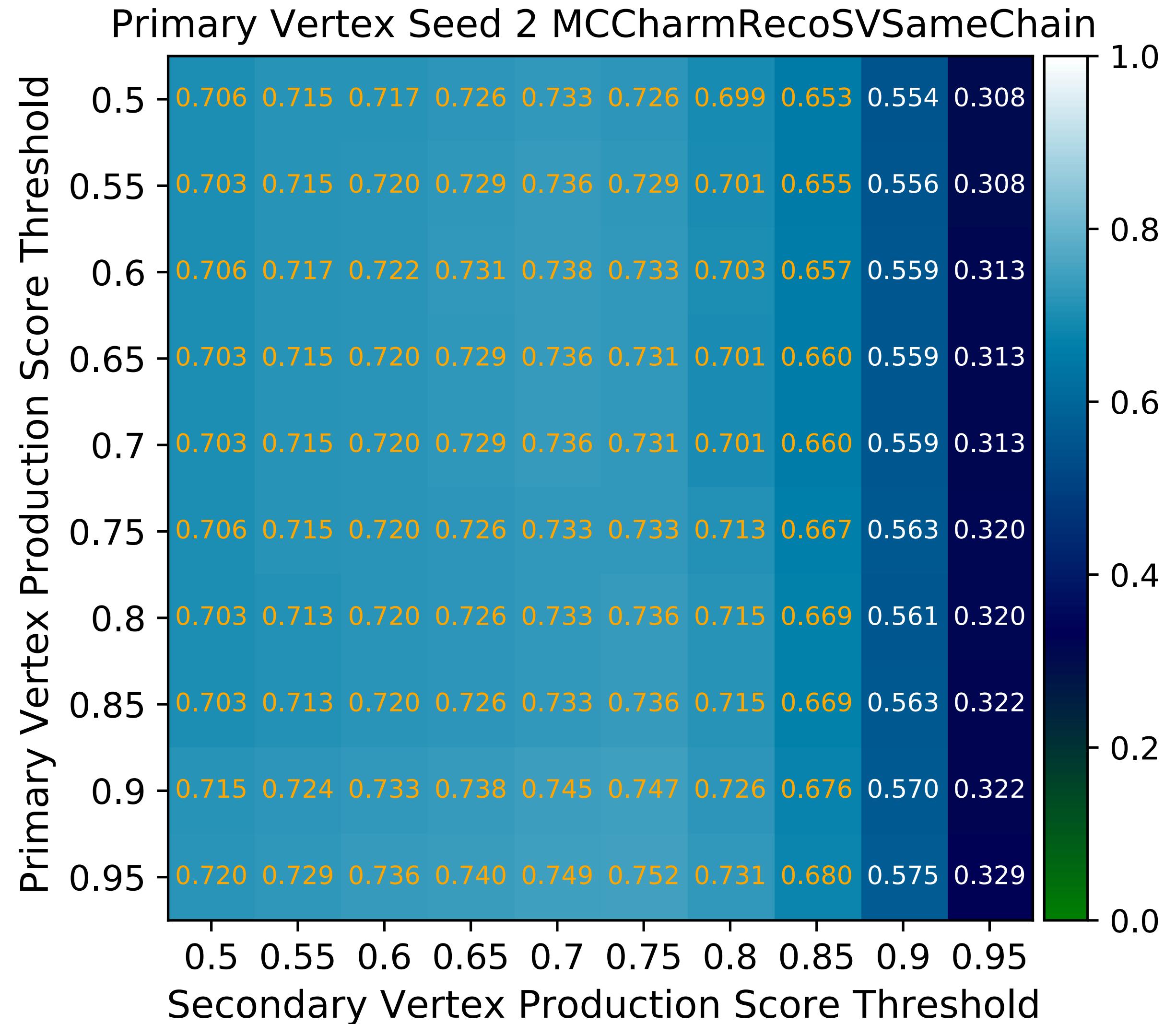
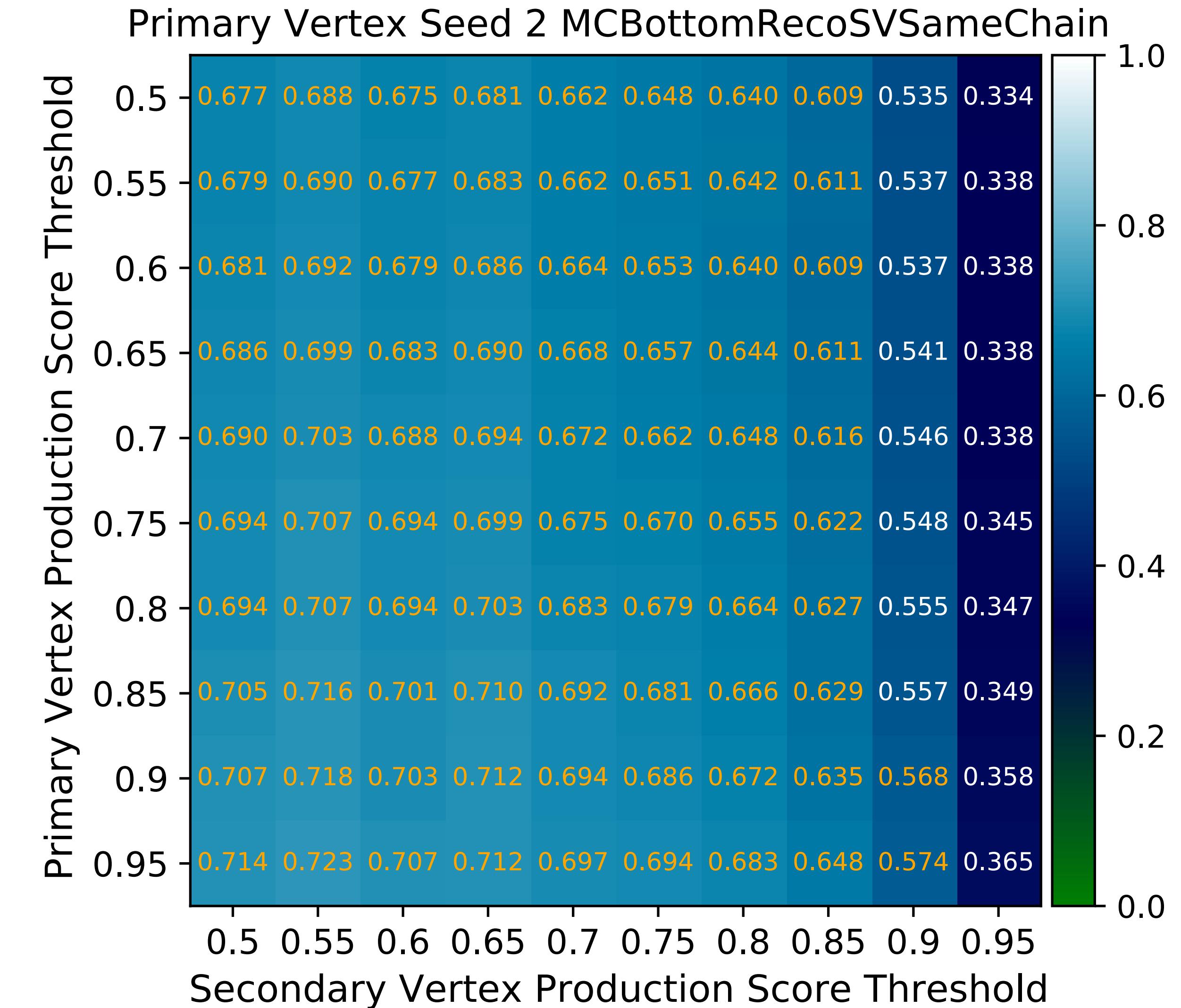


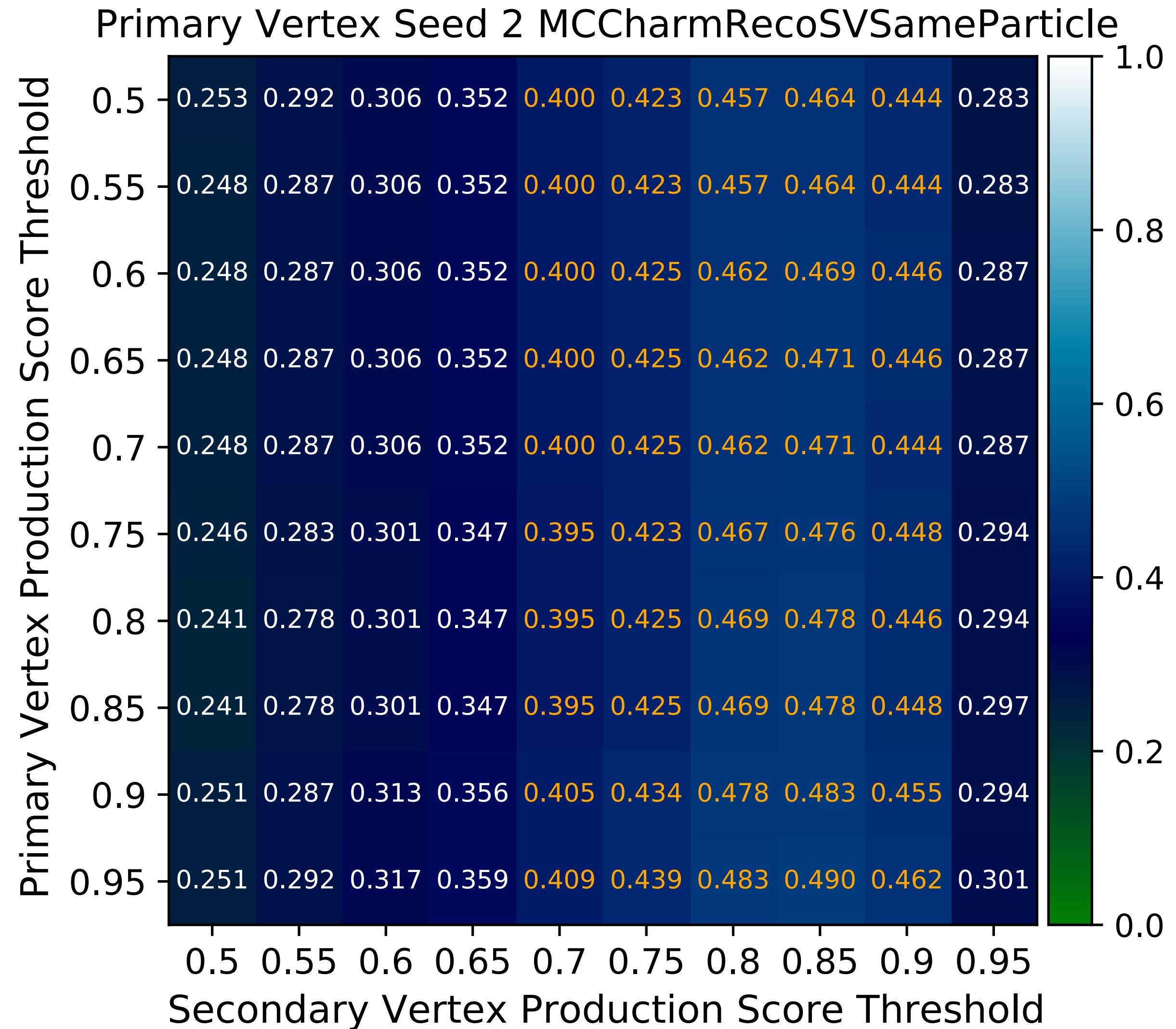
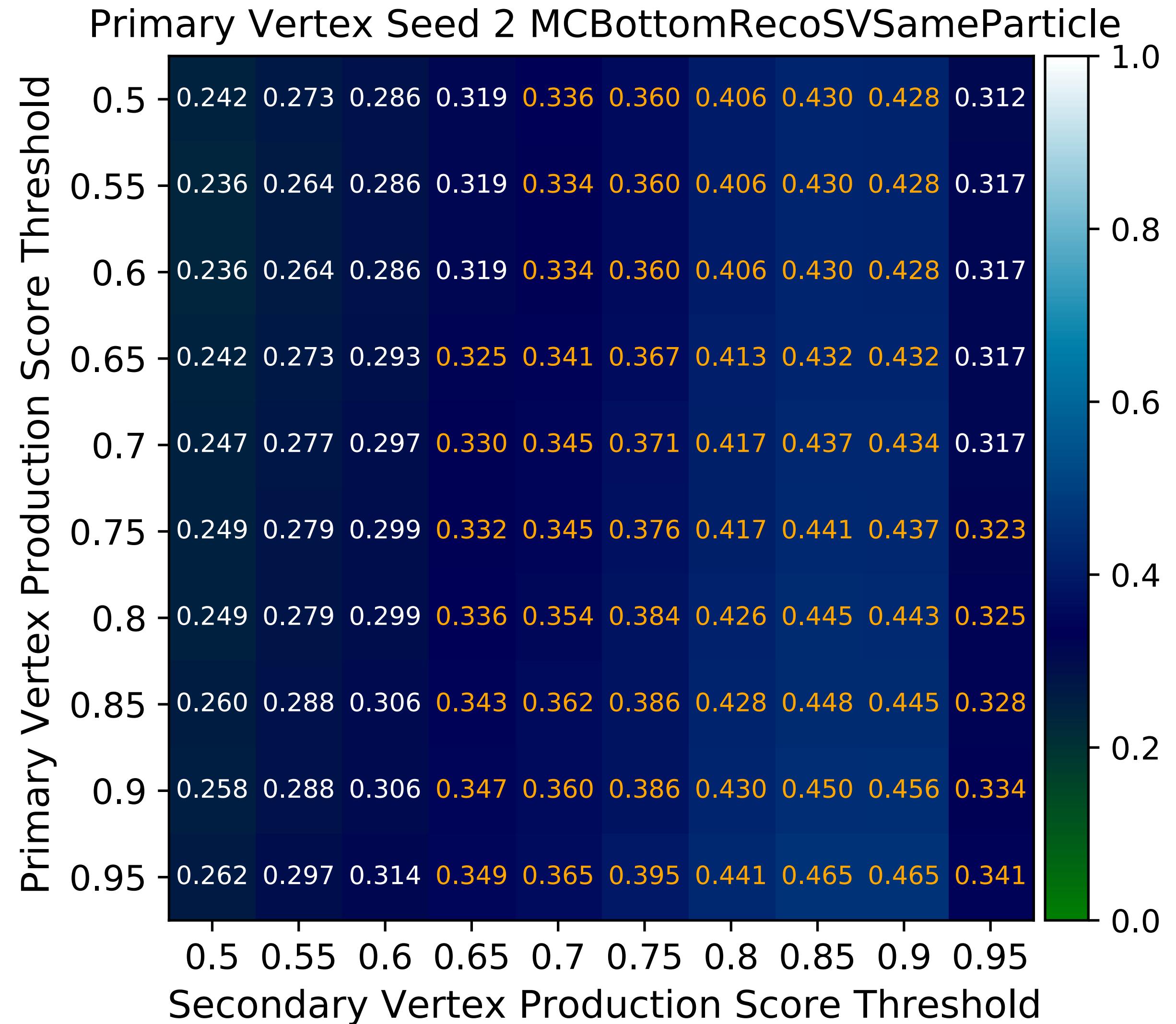
Charm, 同一の親粒子

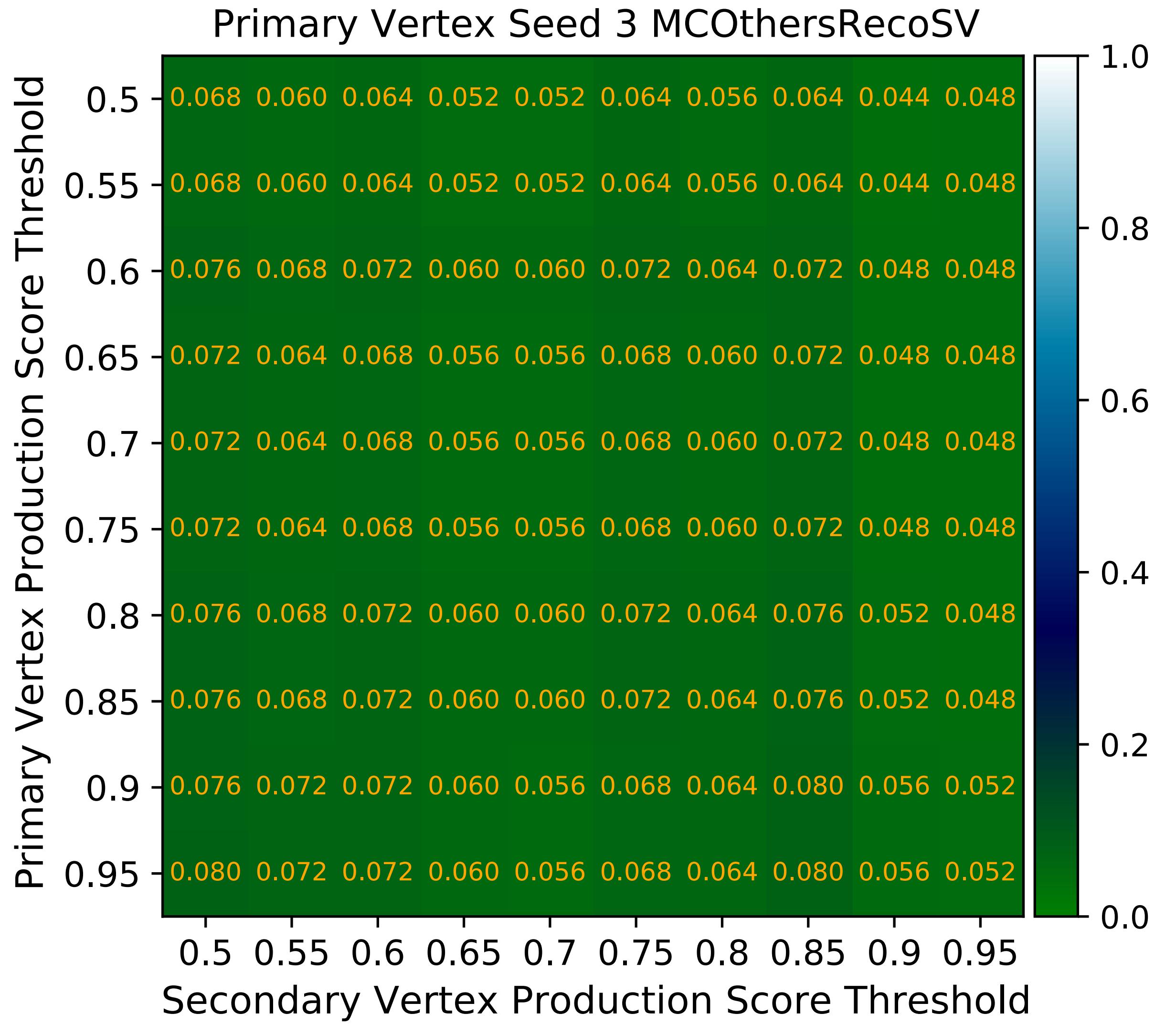
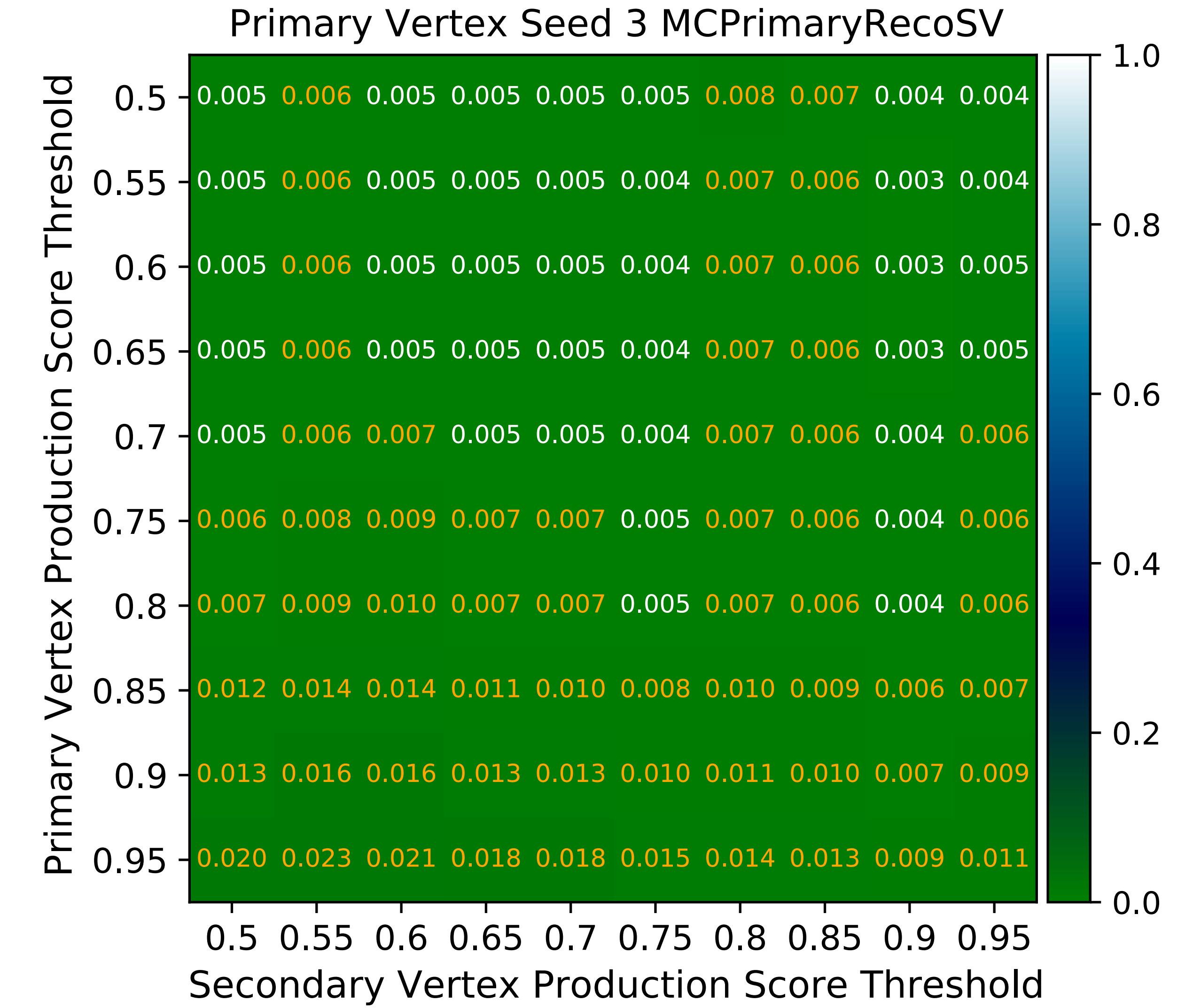


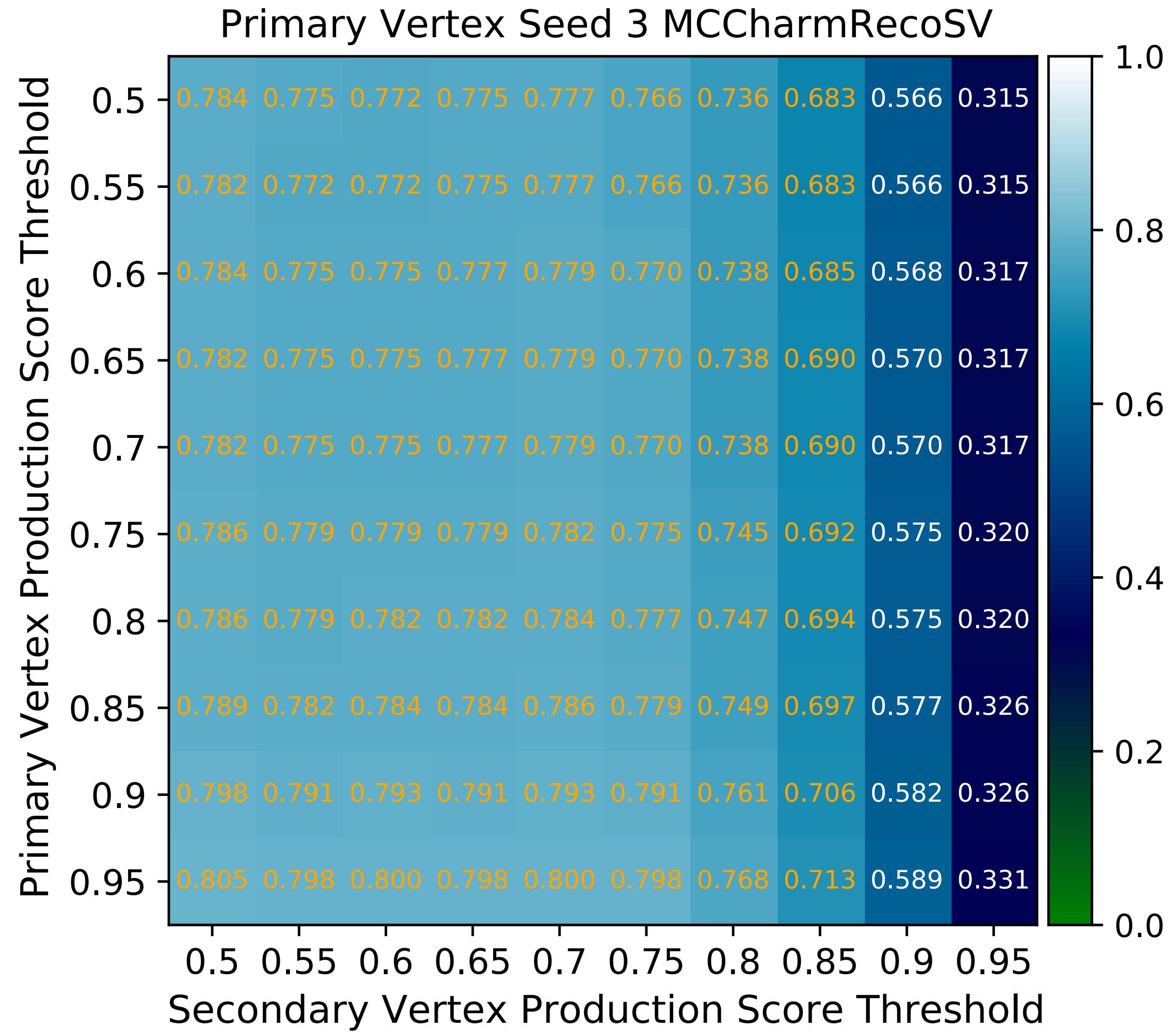
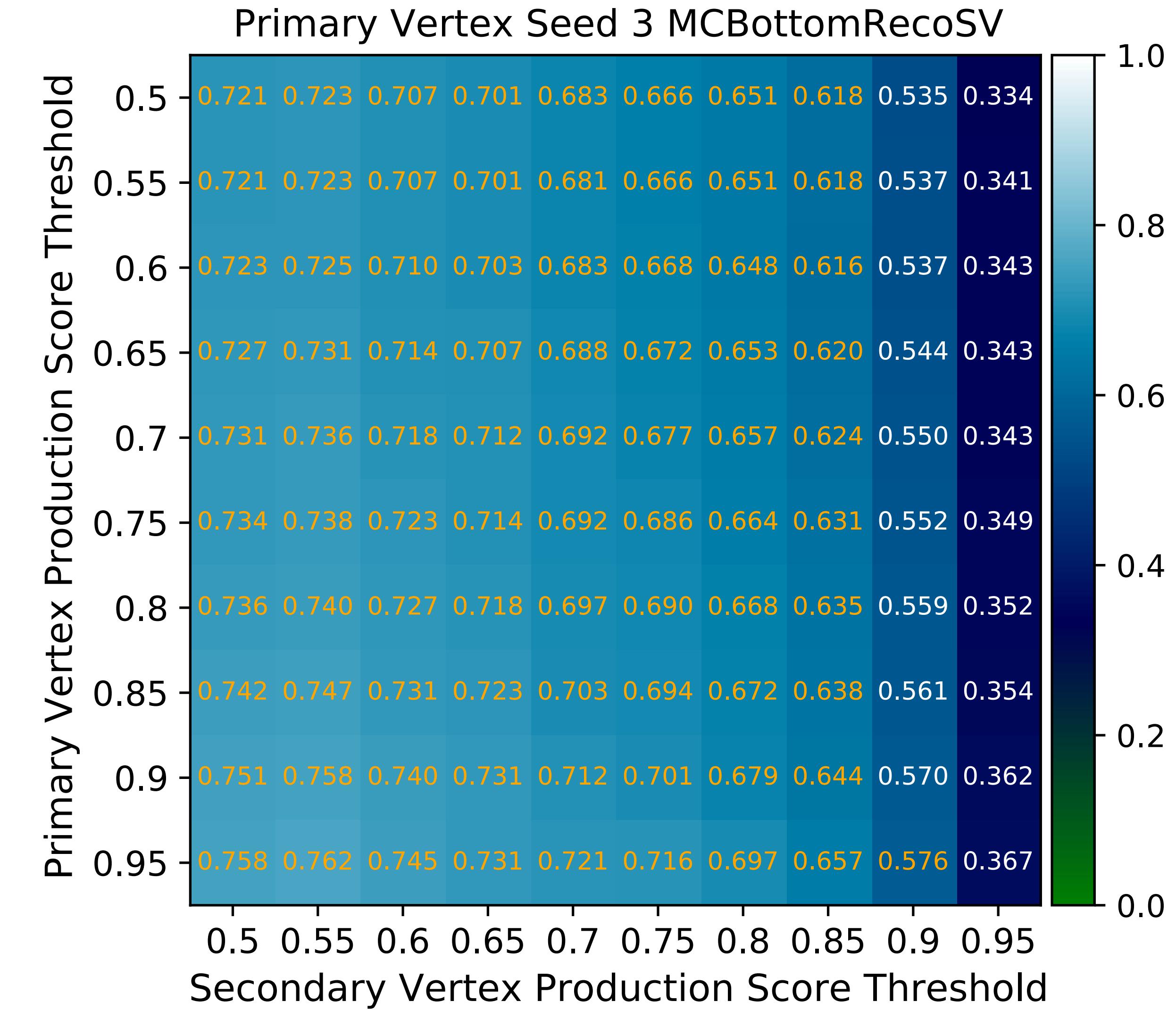


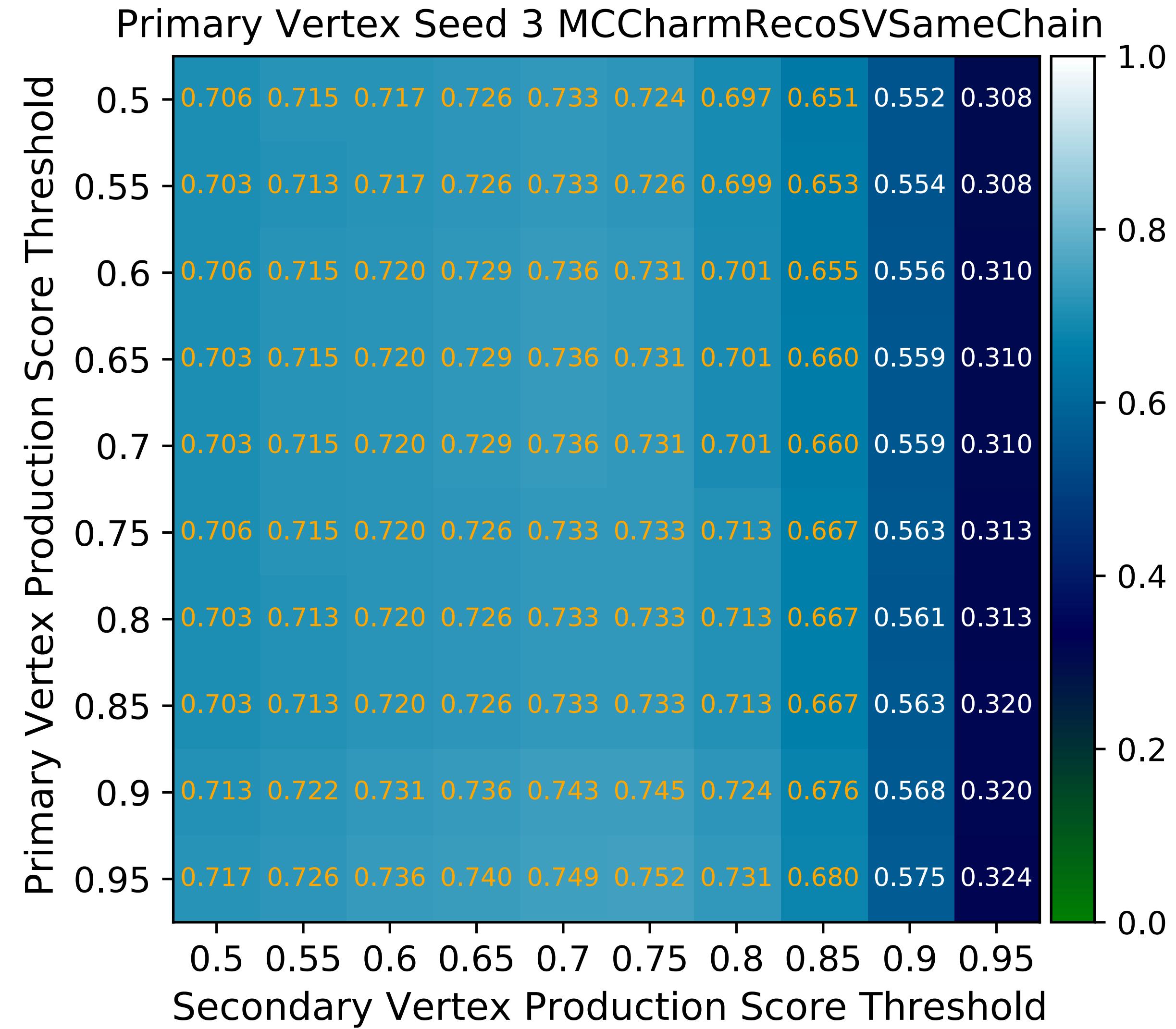
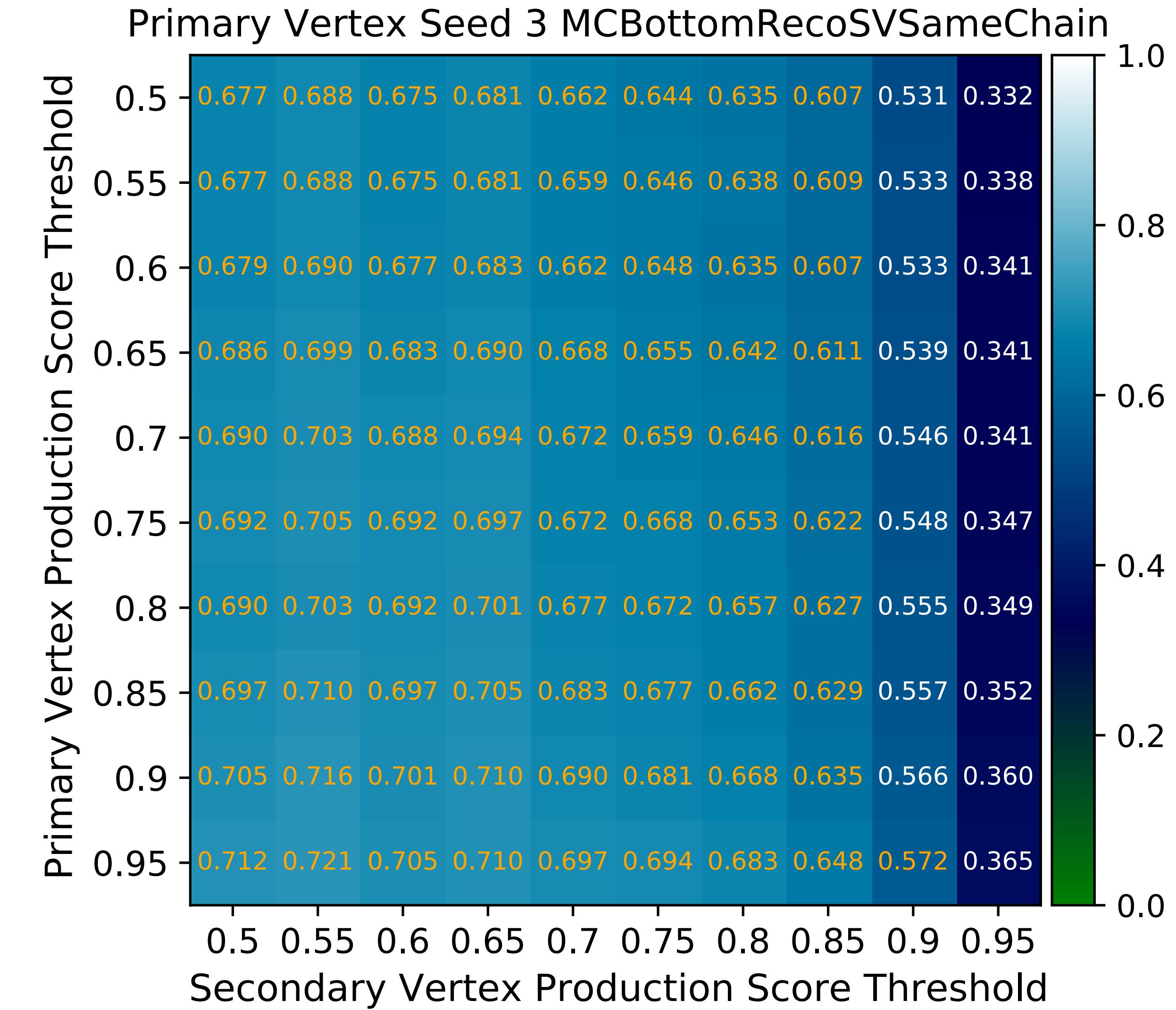


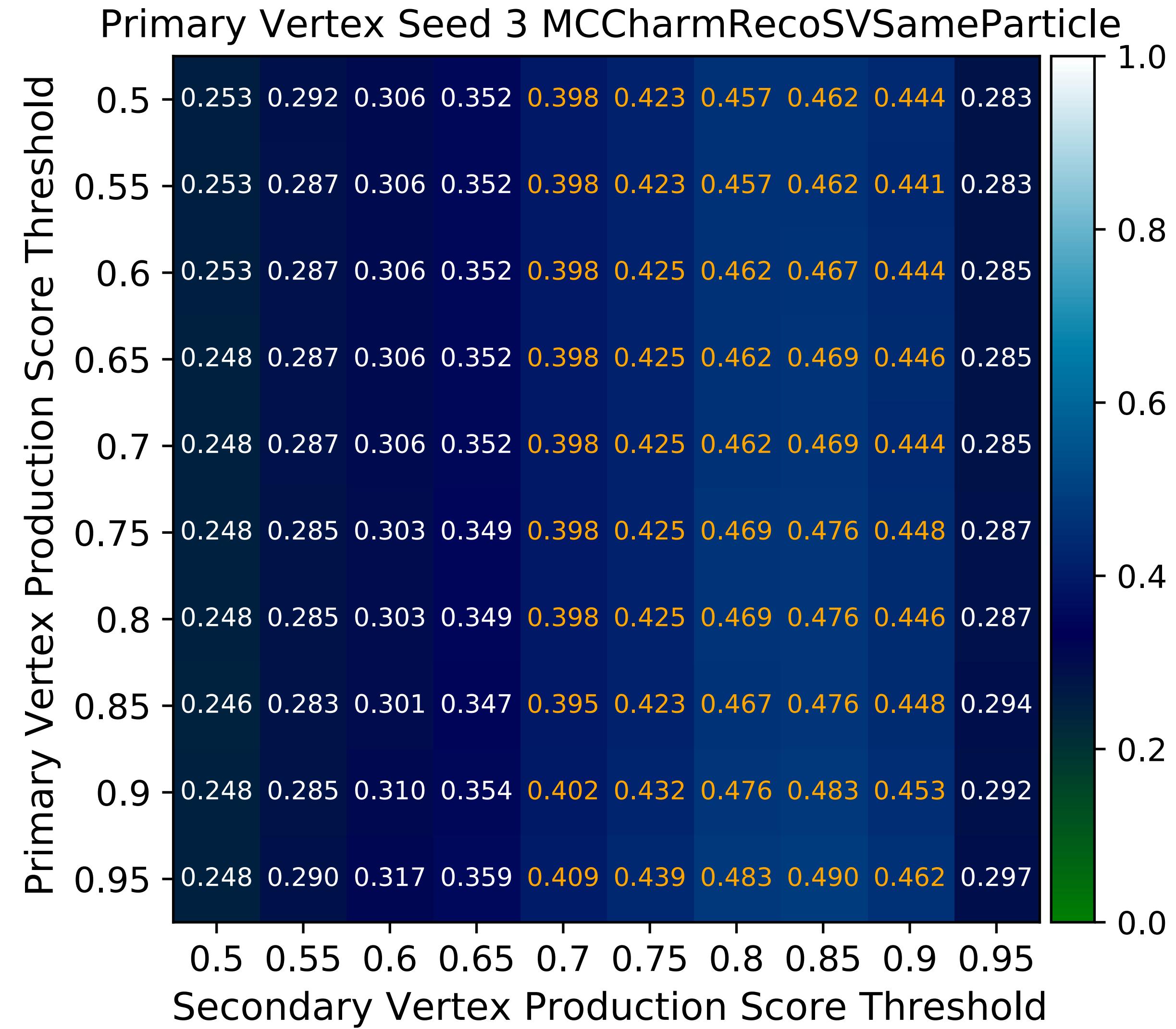
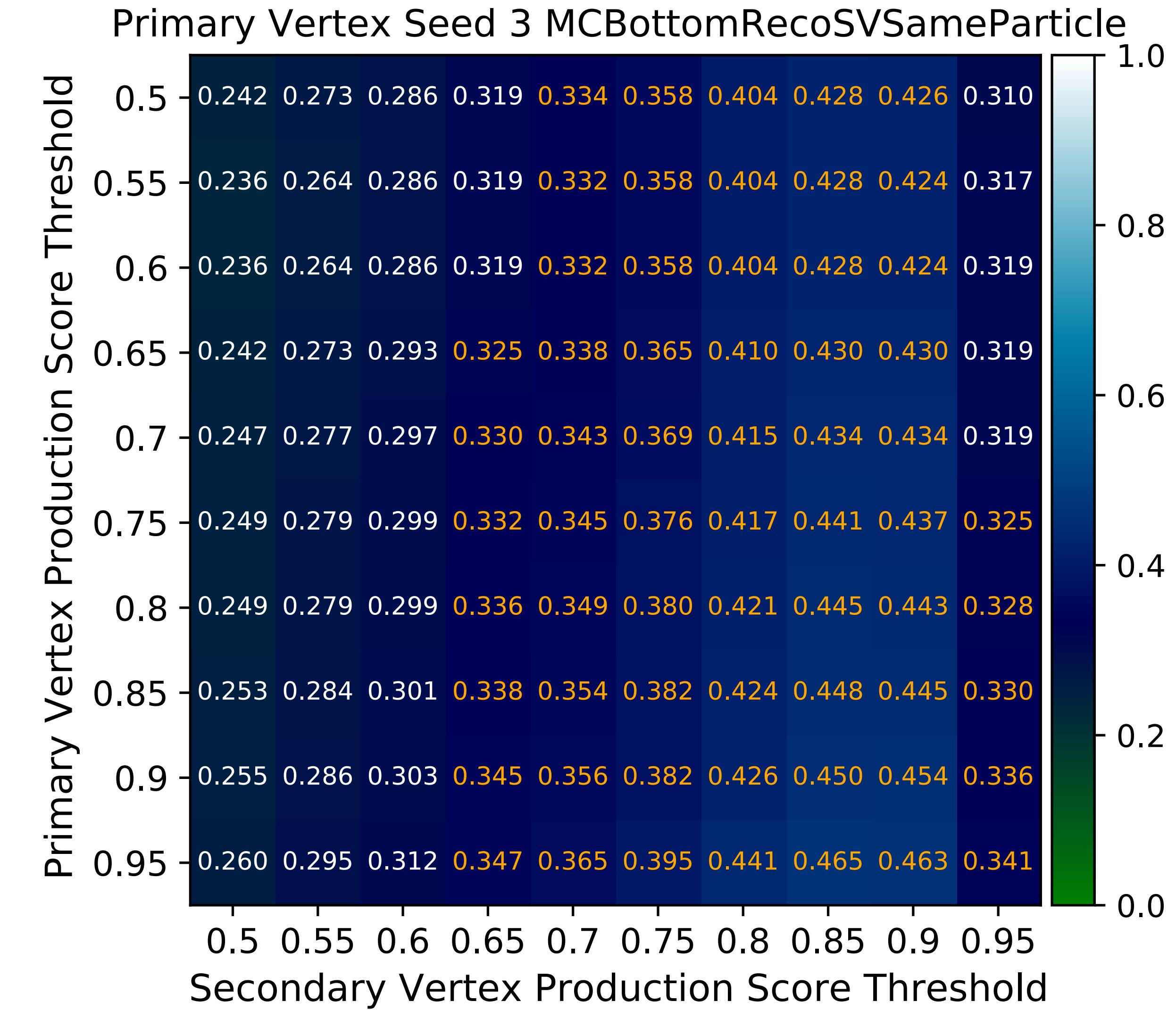




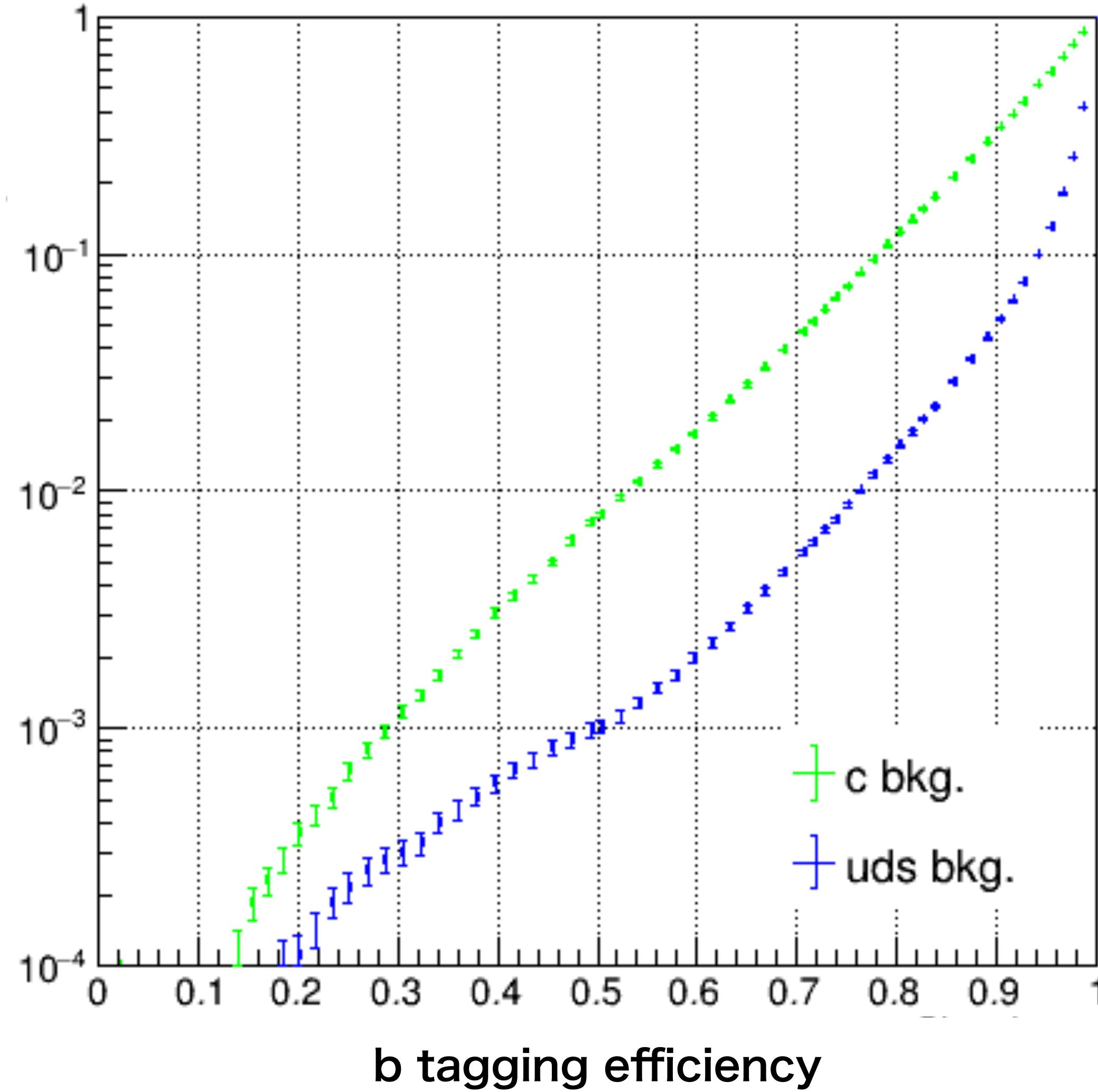








BG efficiency



BG efficiency

