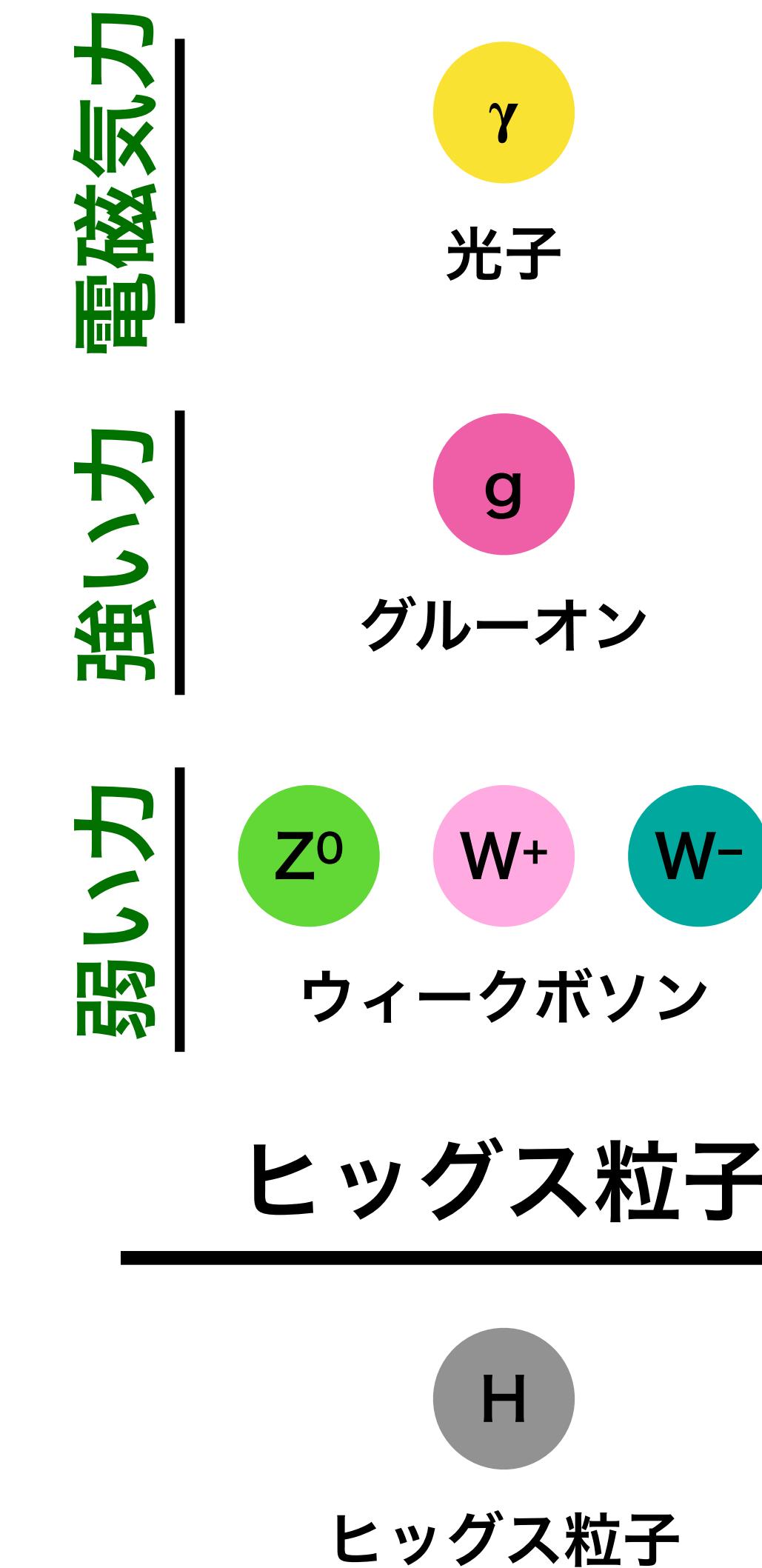


フェルミ粒子

	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

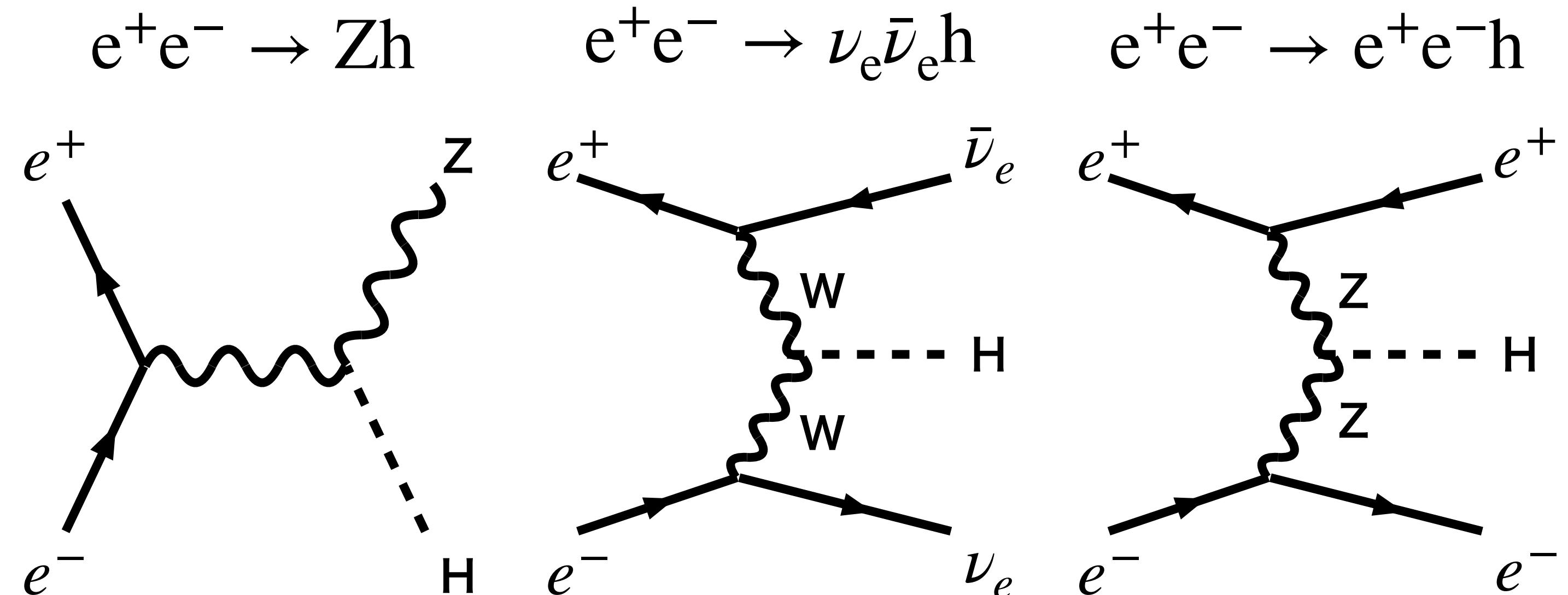
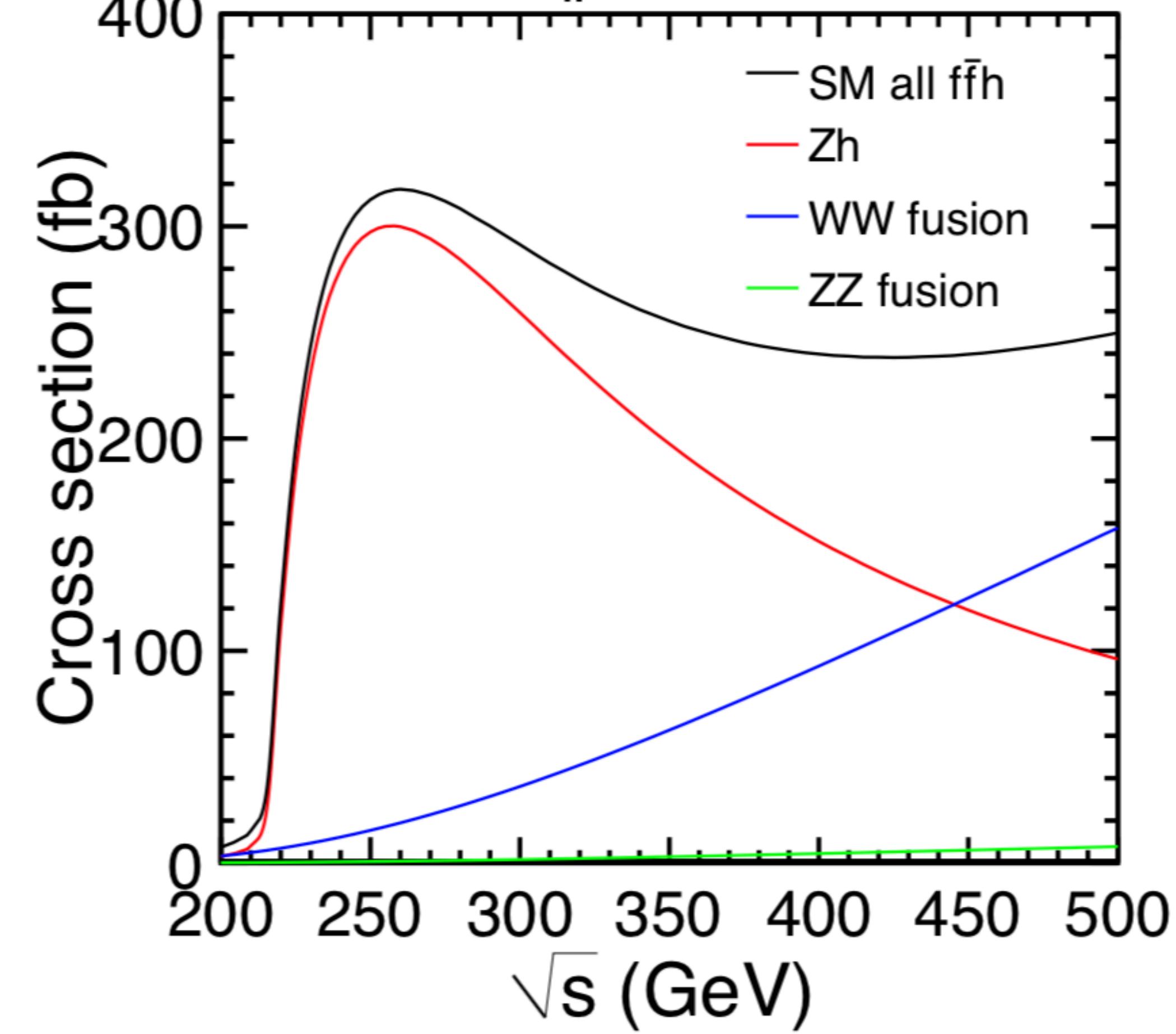
Light-weight
MoUs

Detailed
MoUs

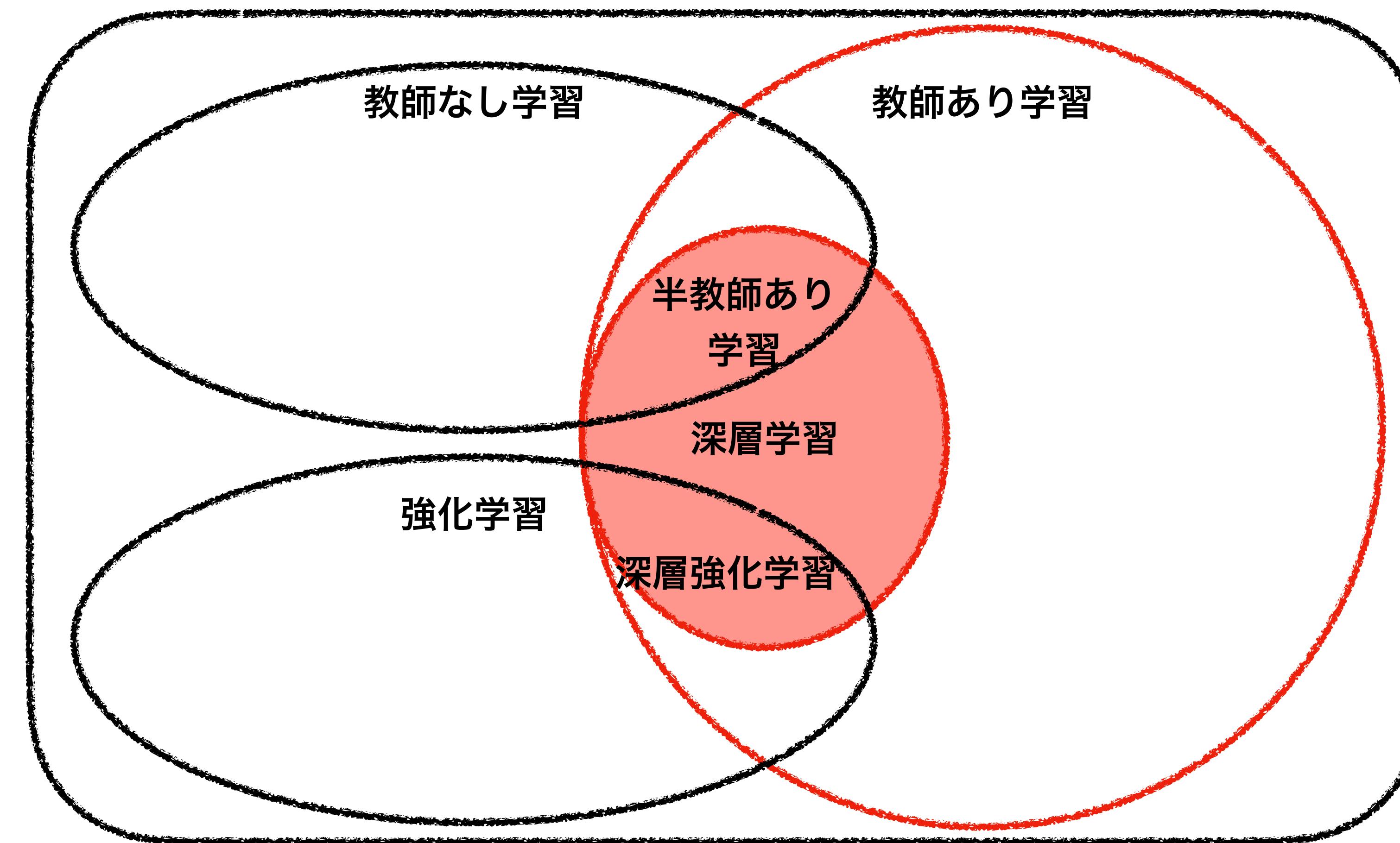
建設

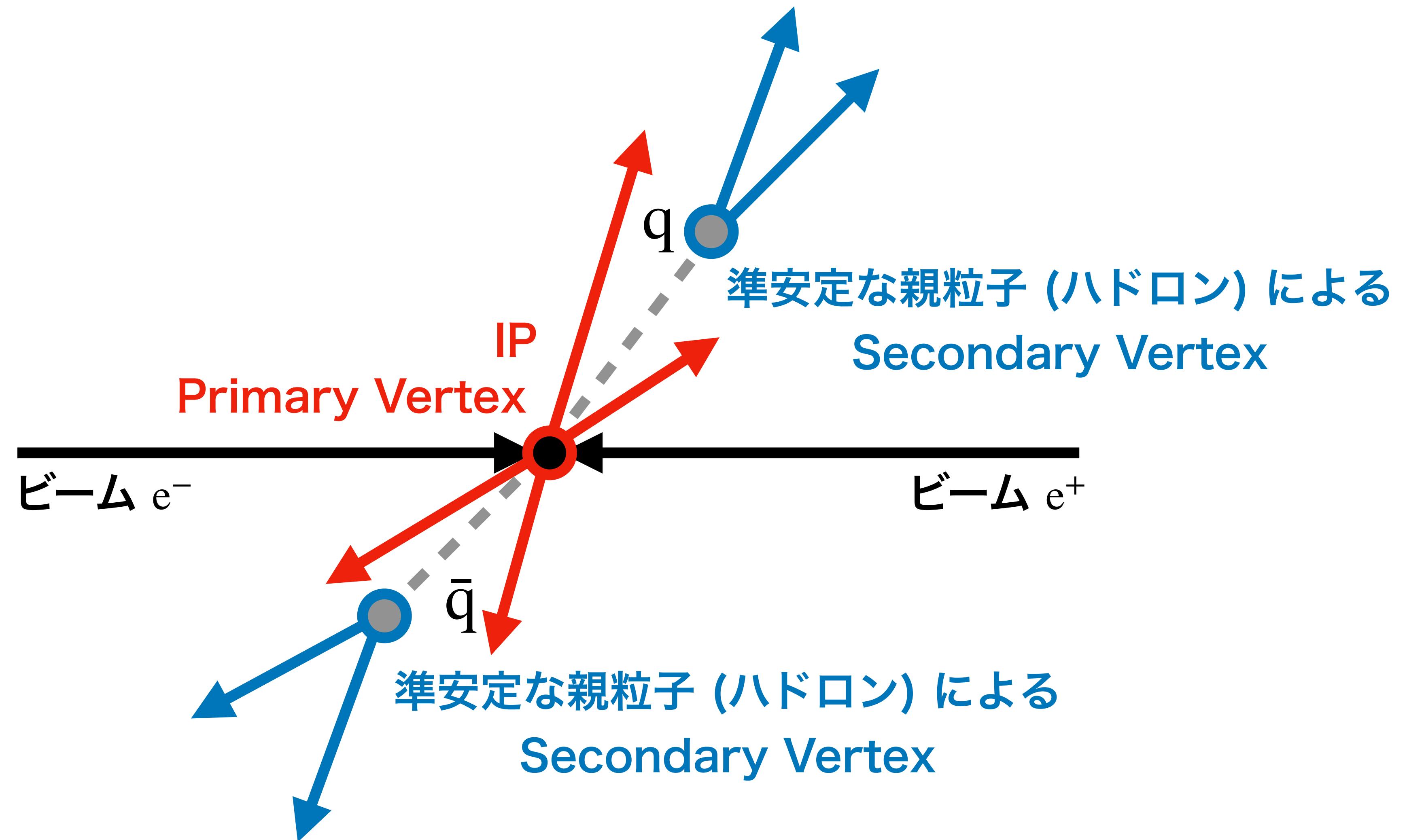
運転

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

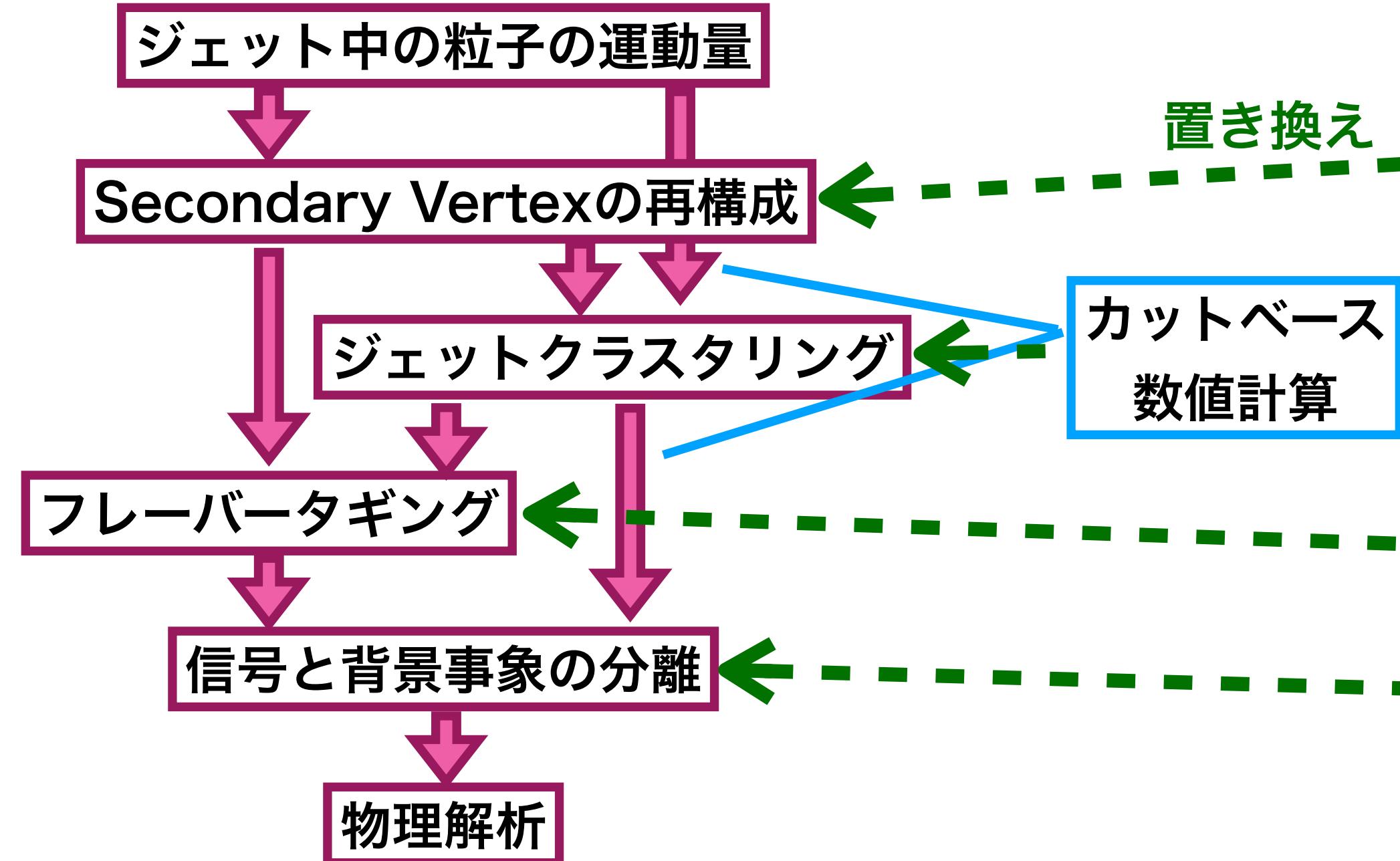


機械学習

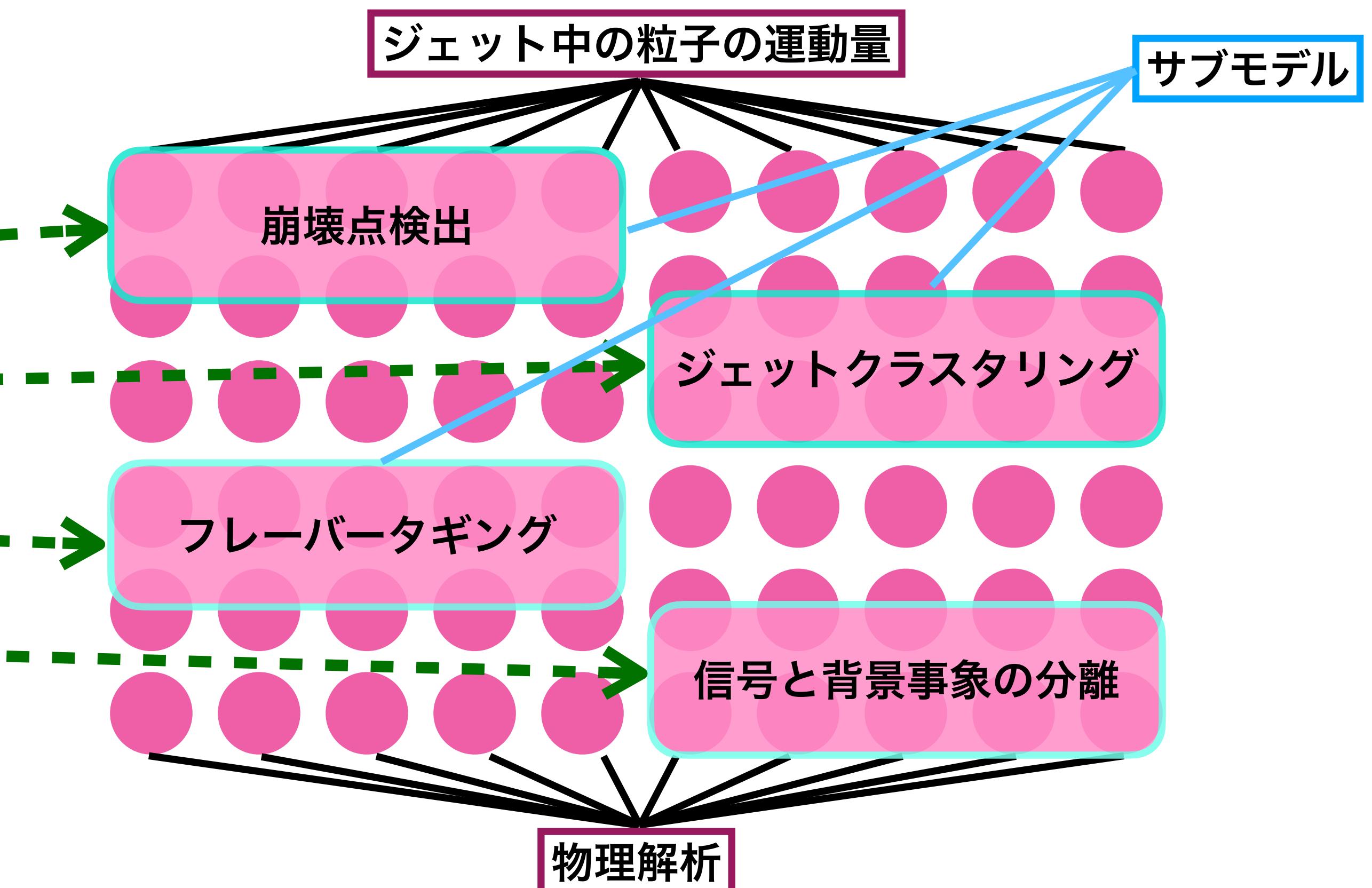


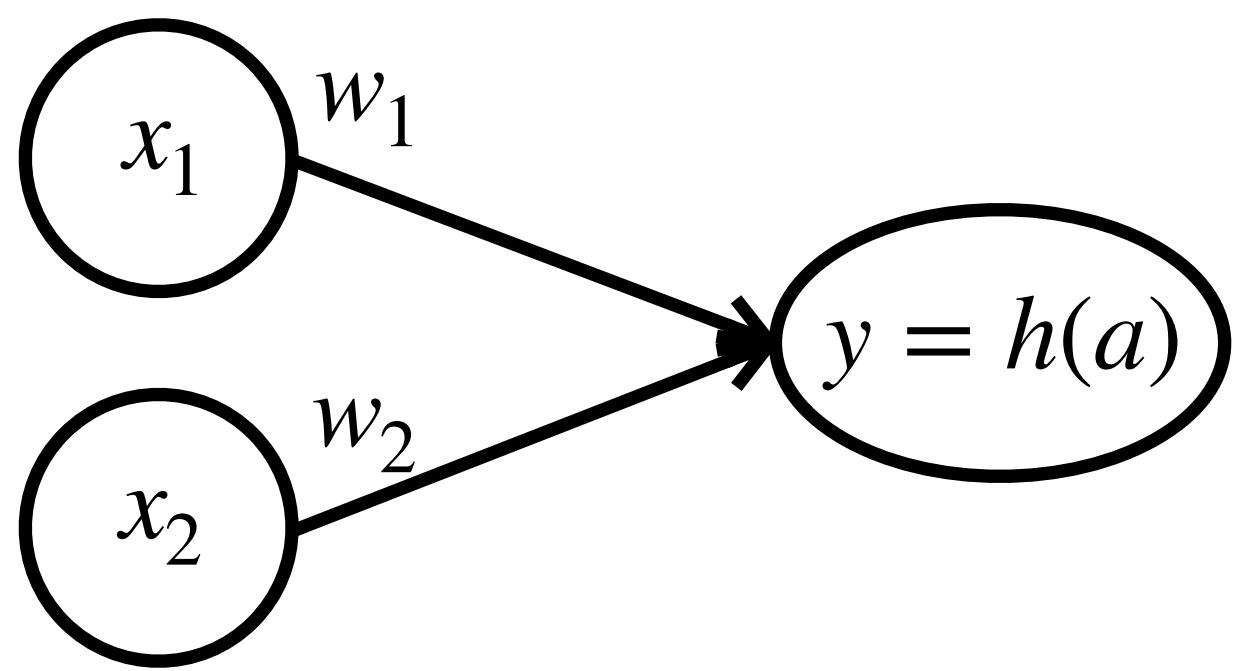


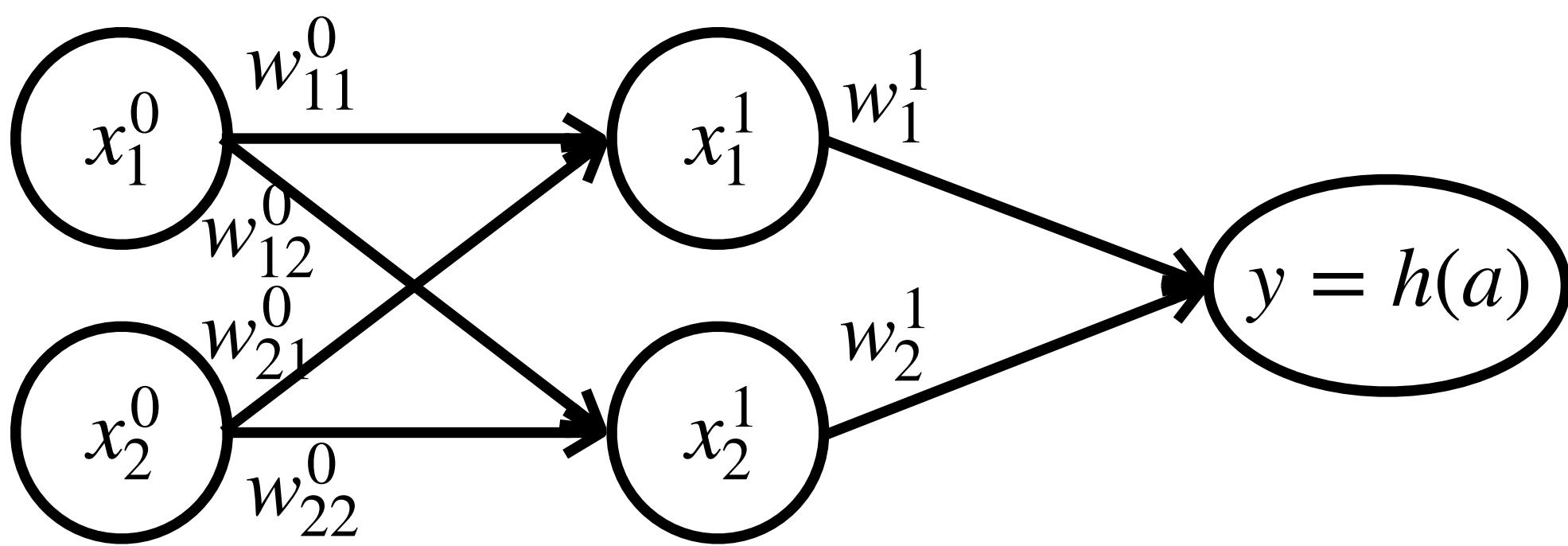
現行の手法



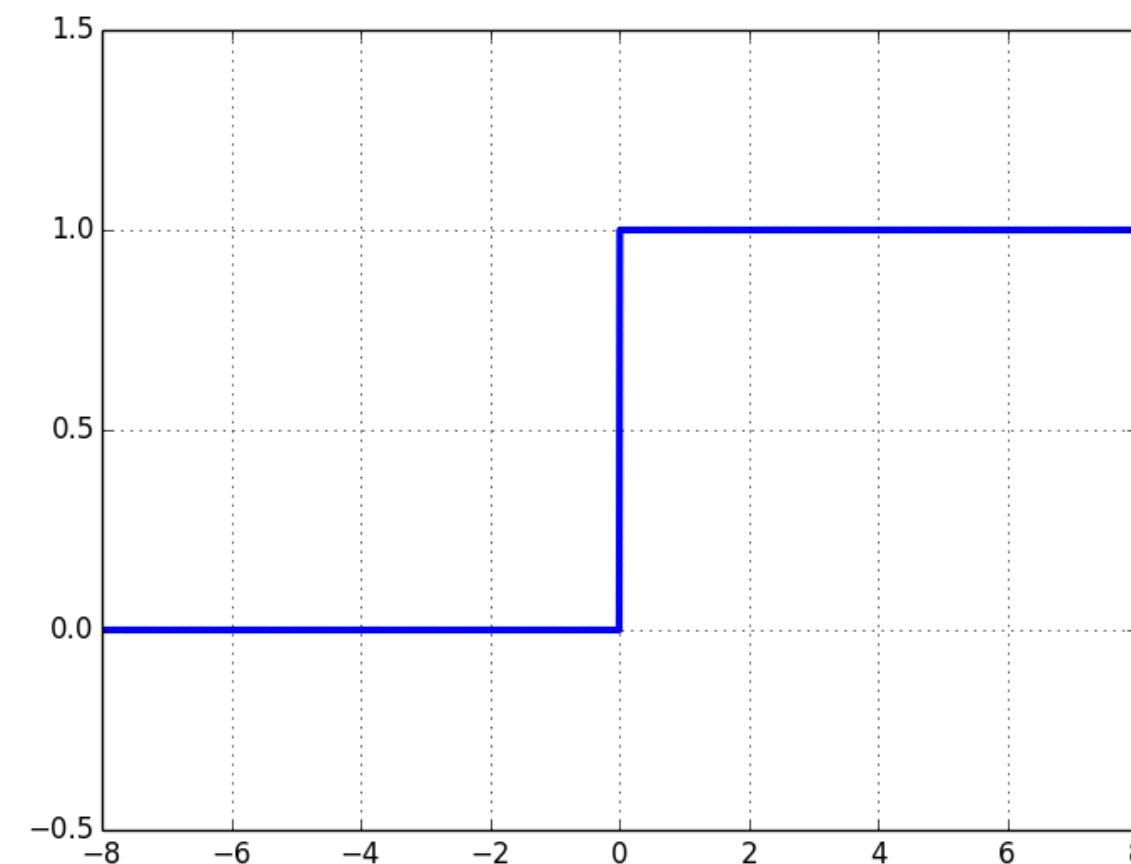
深層学習



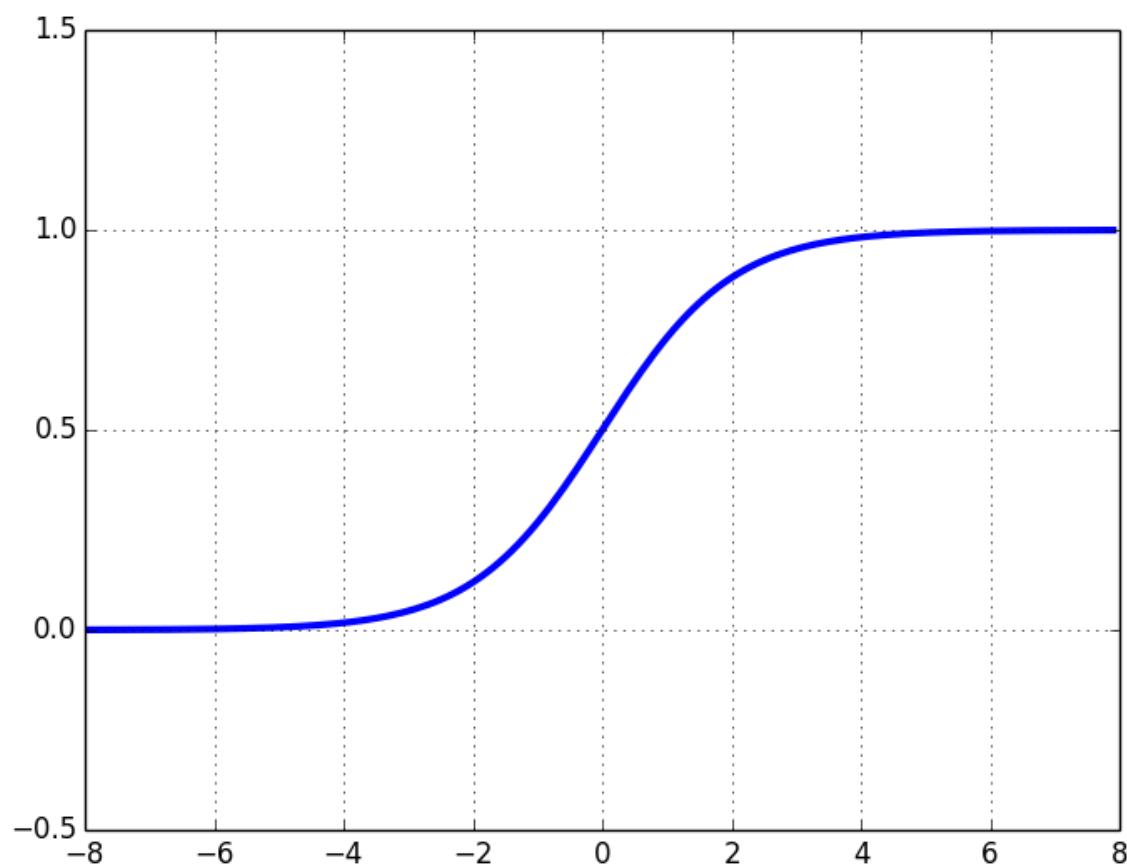




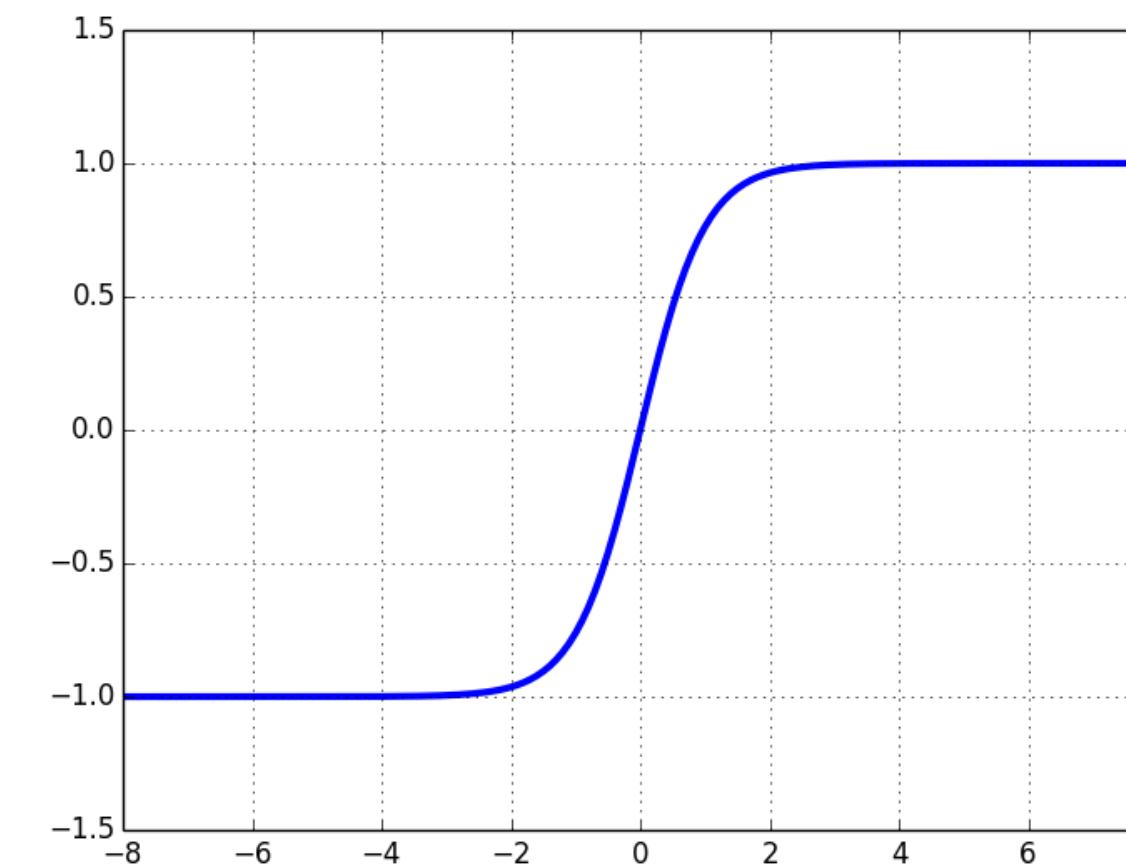
階段関数



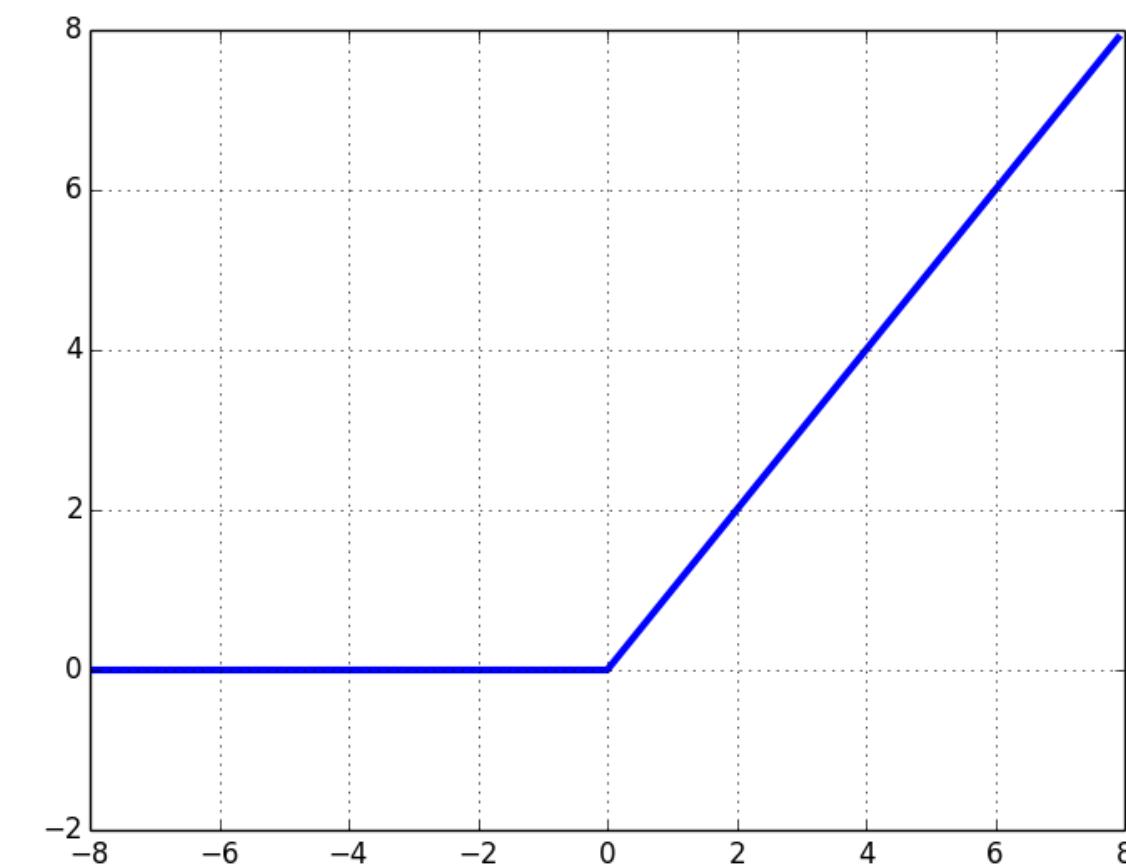
シグモイド関数

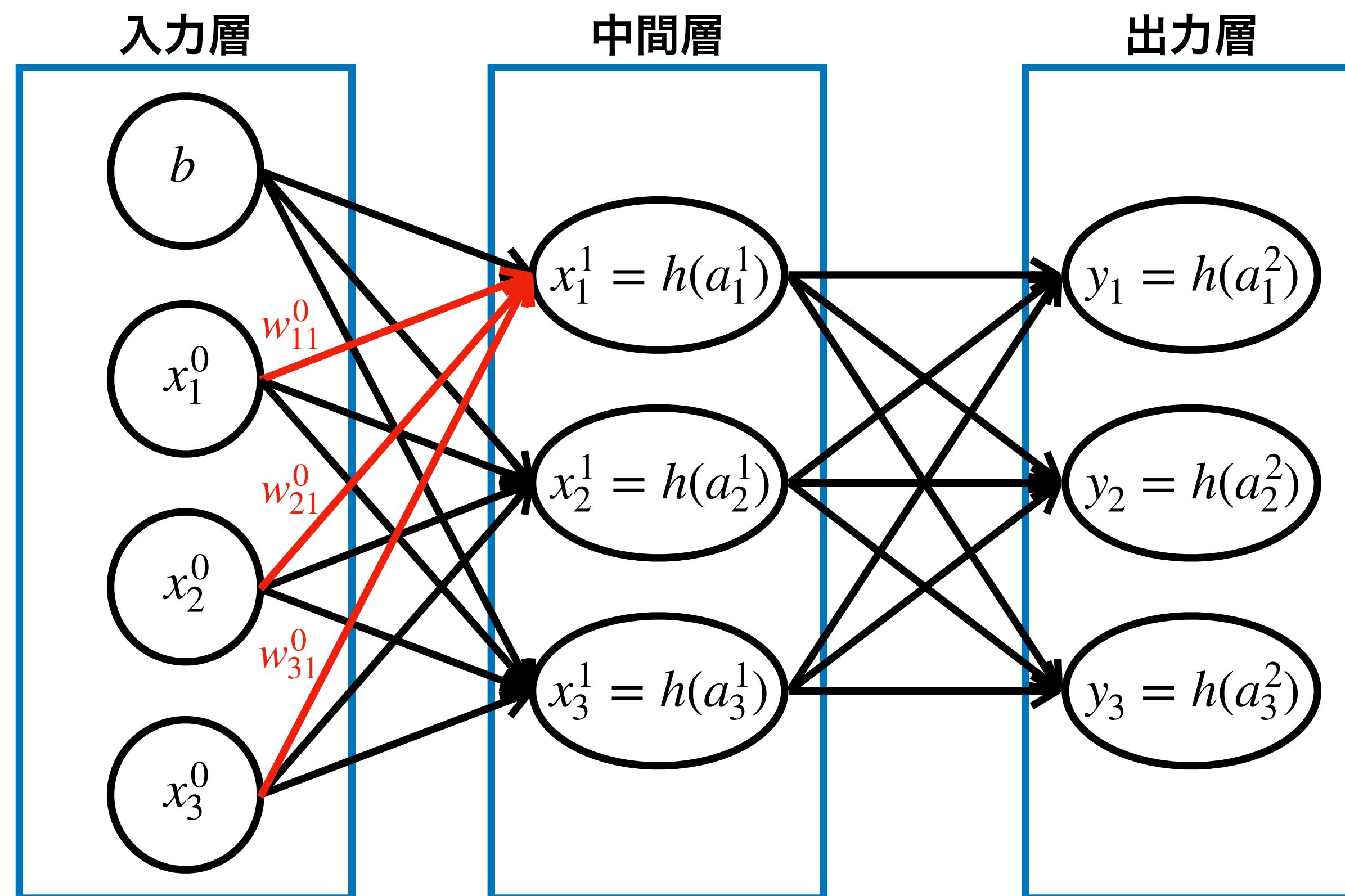


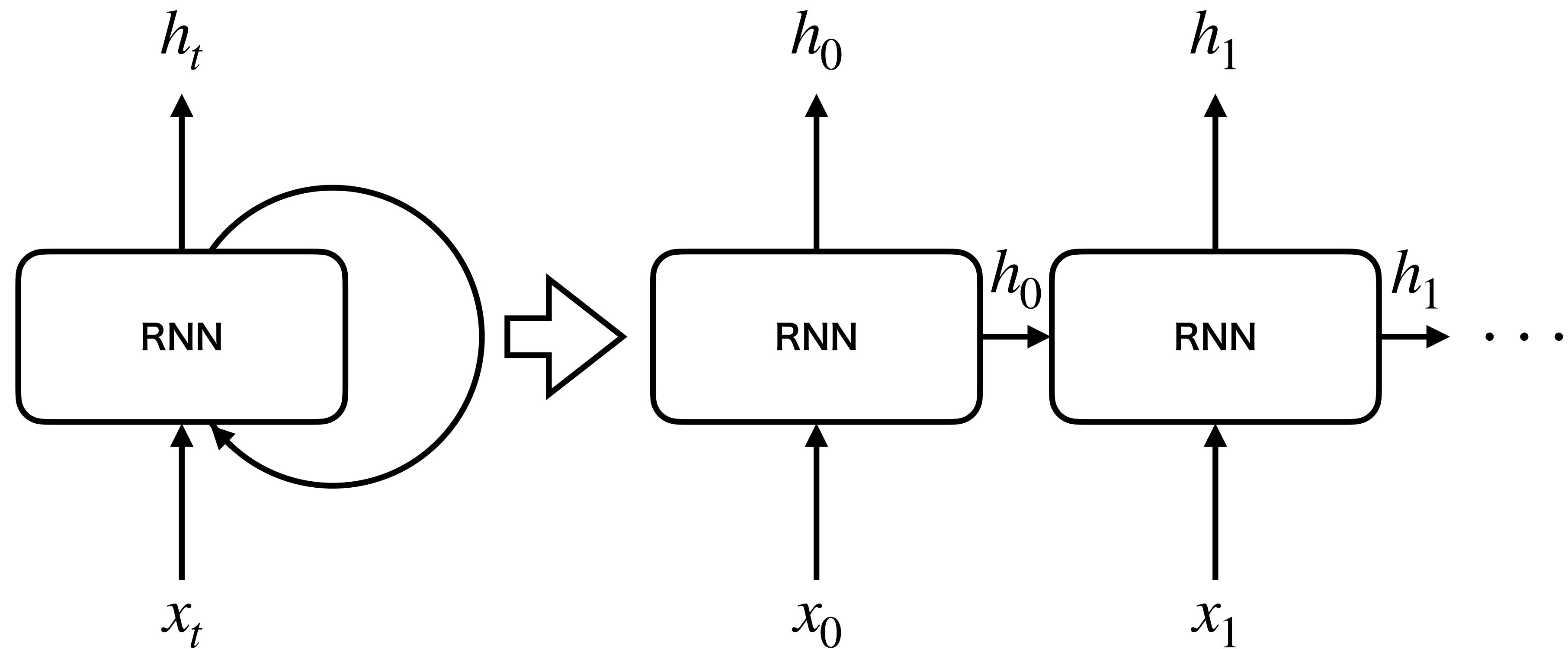
tanh関数

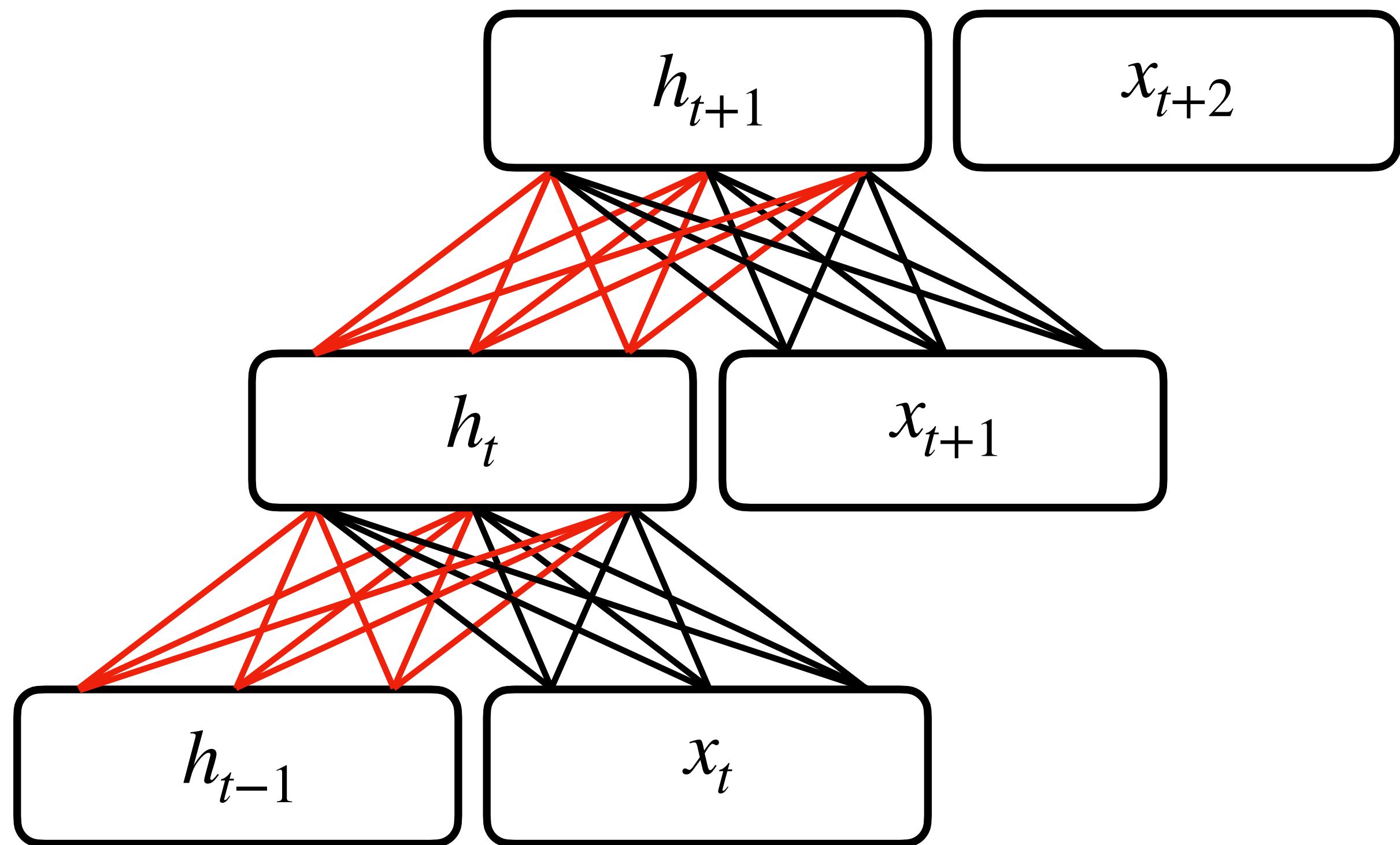


ReLU関数

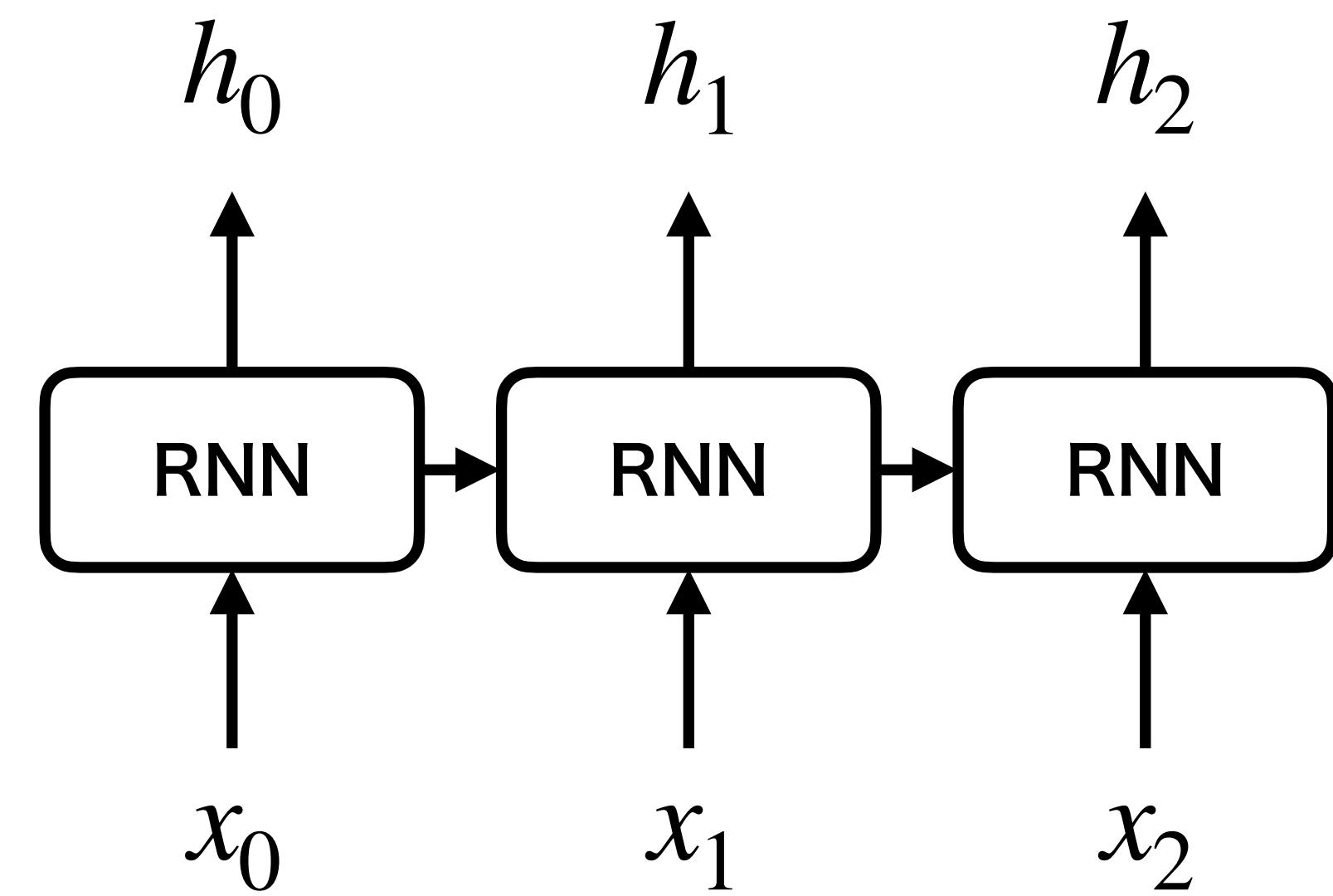




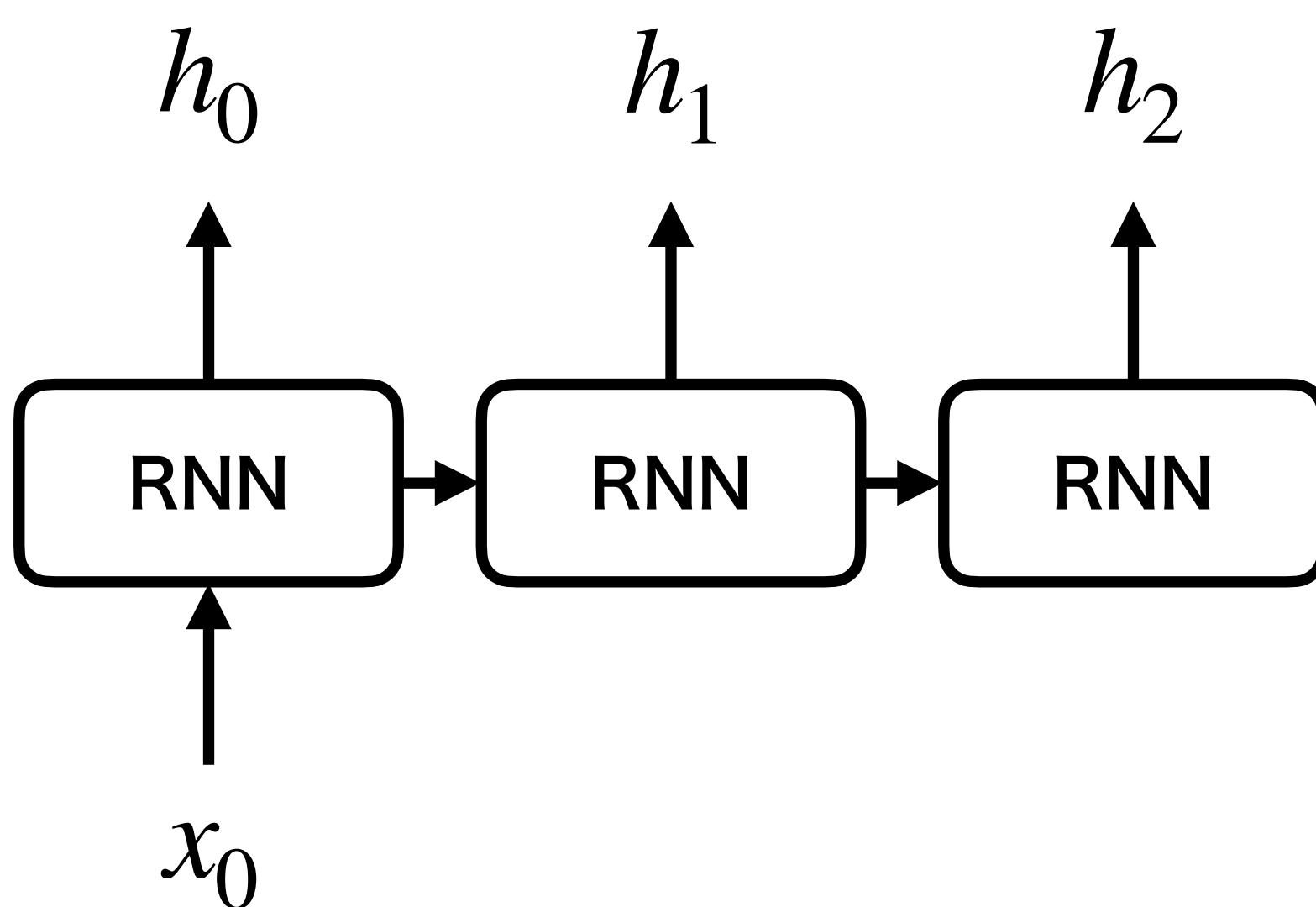




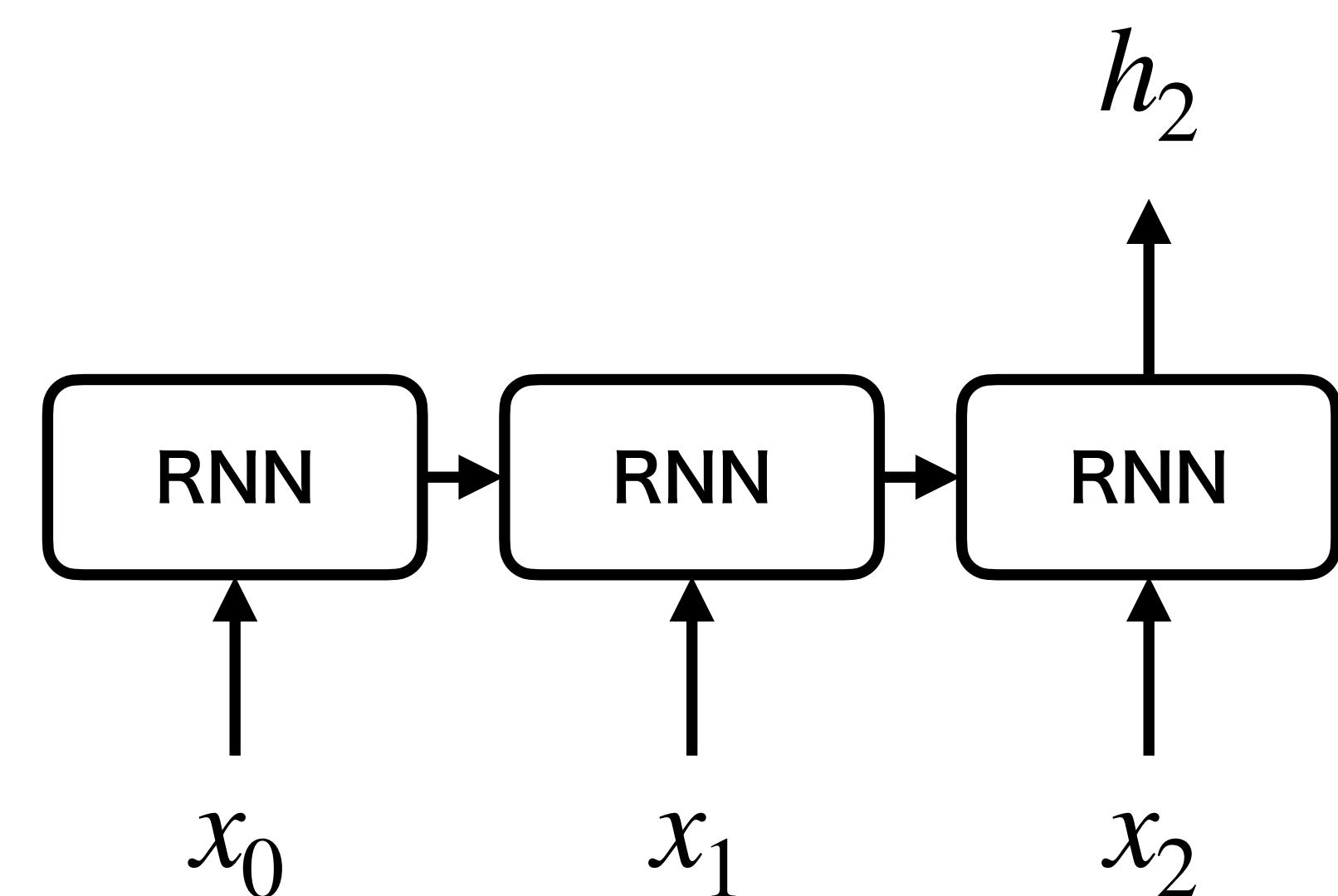
Many to Many

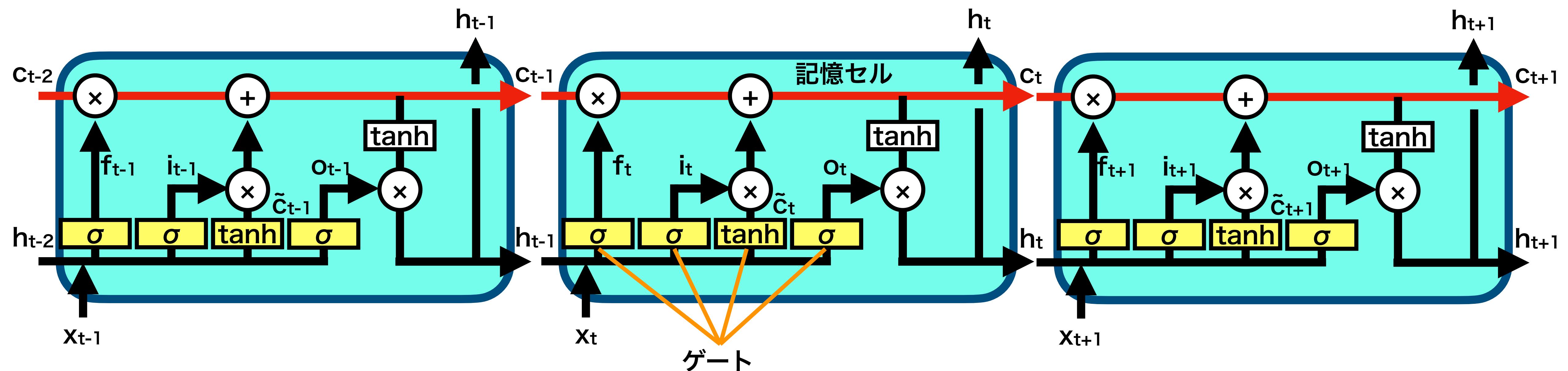


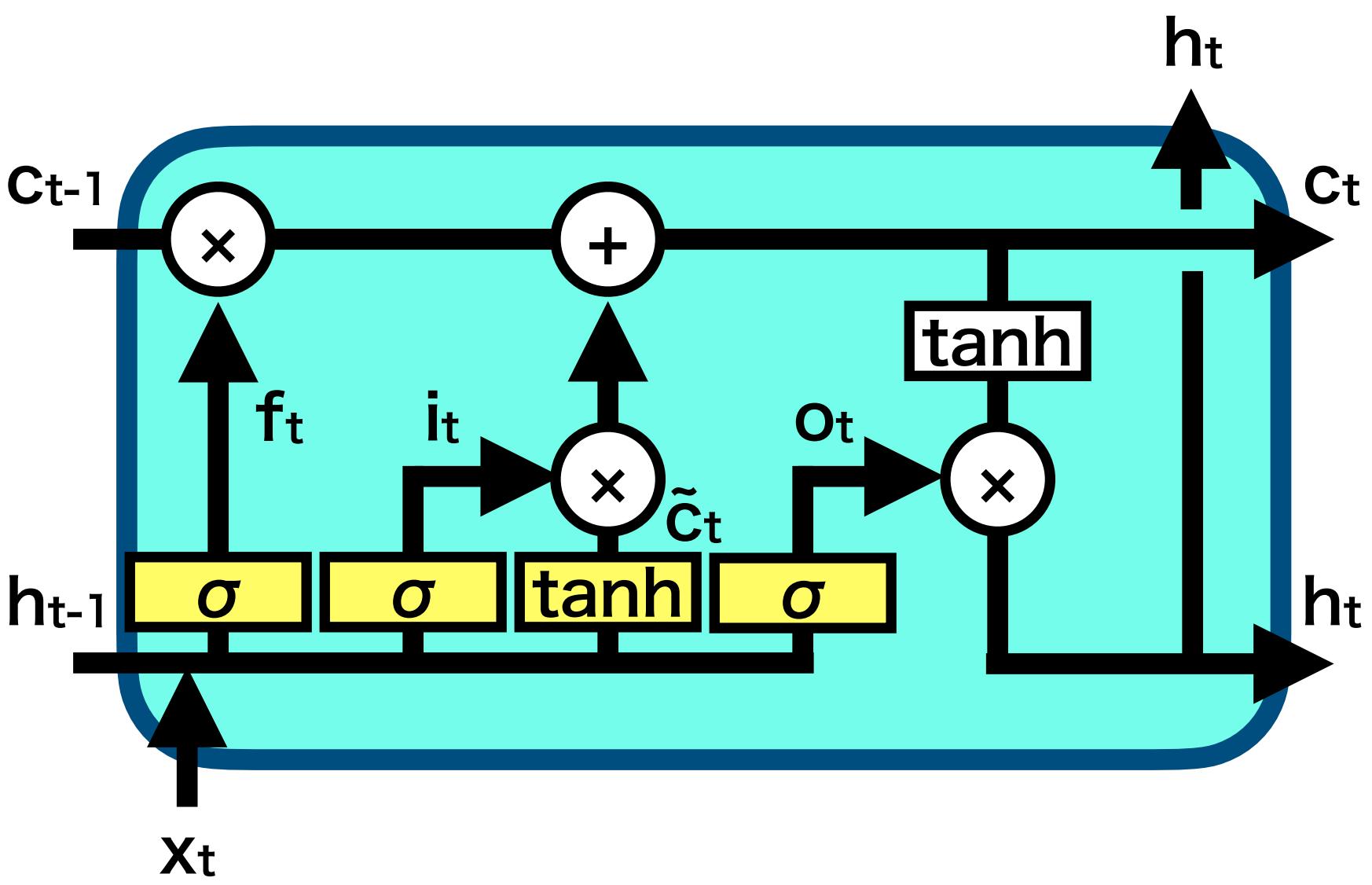
One to Many

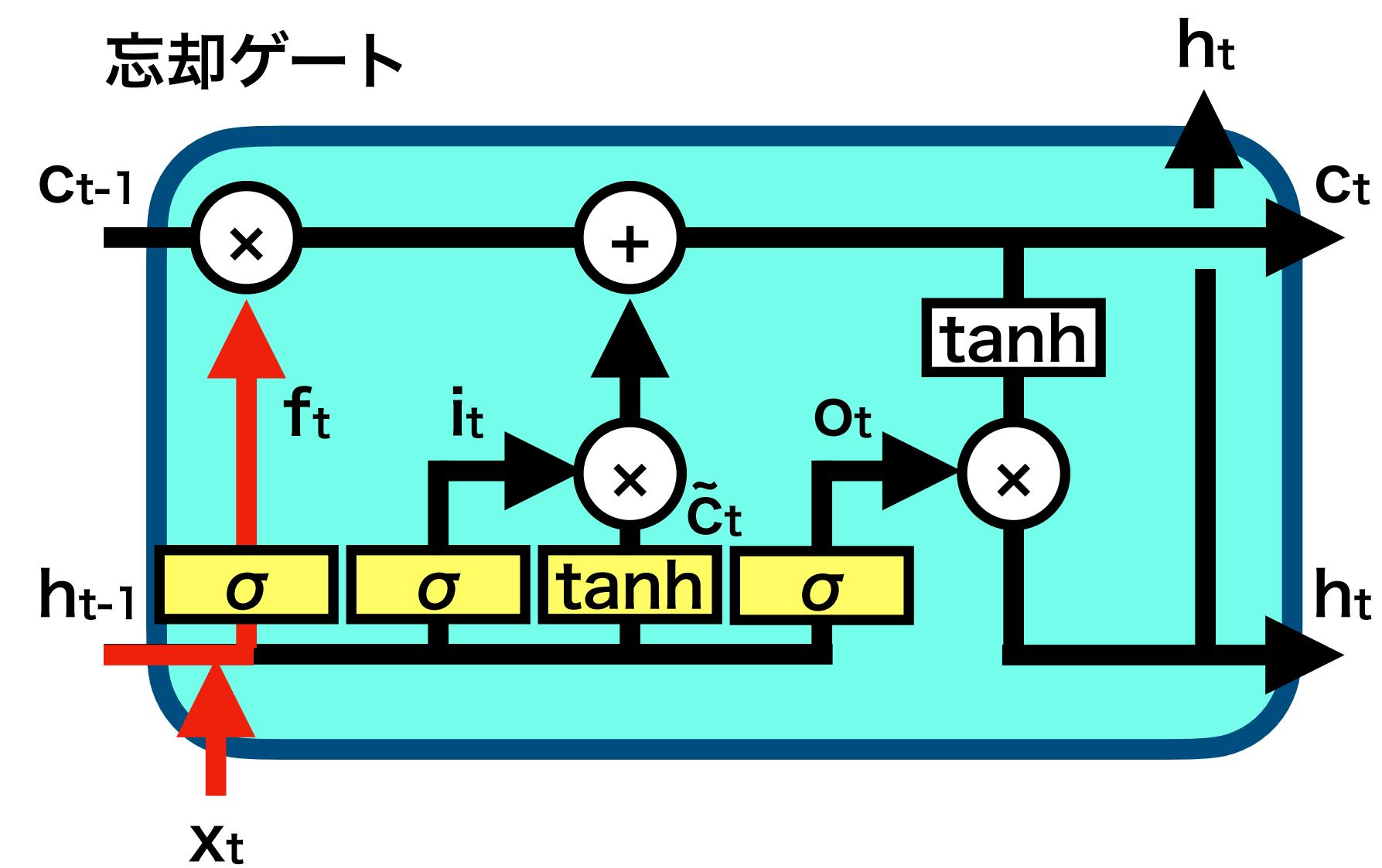


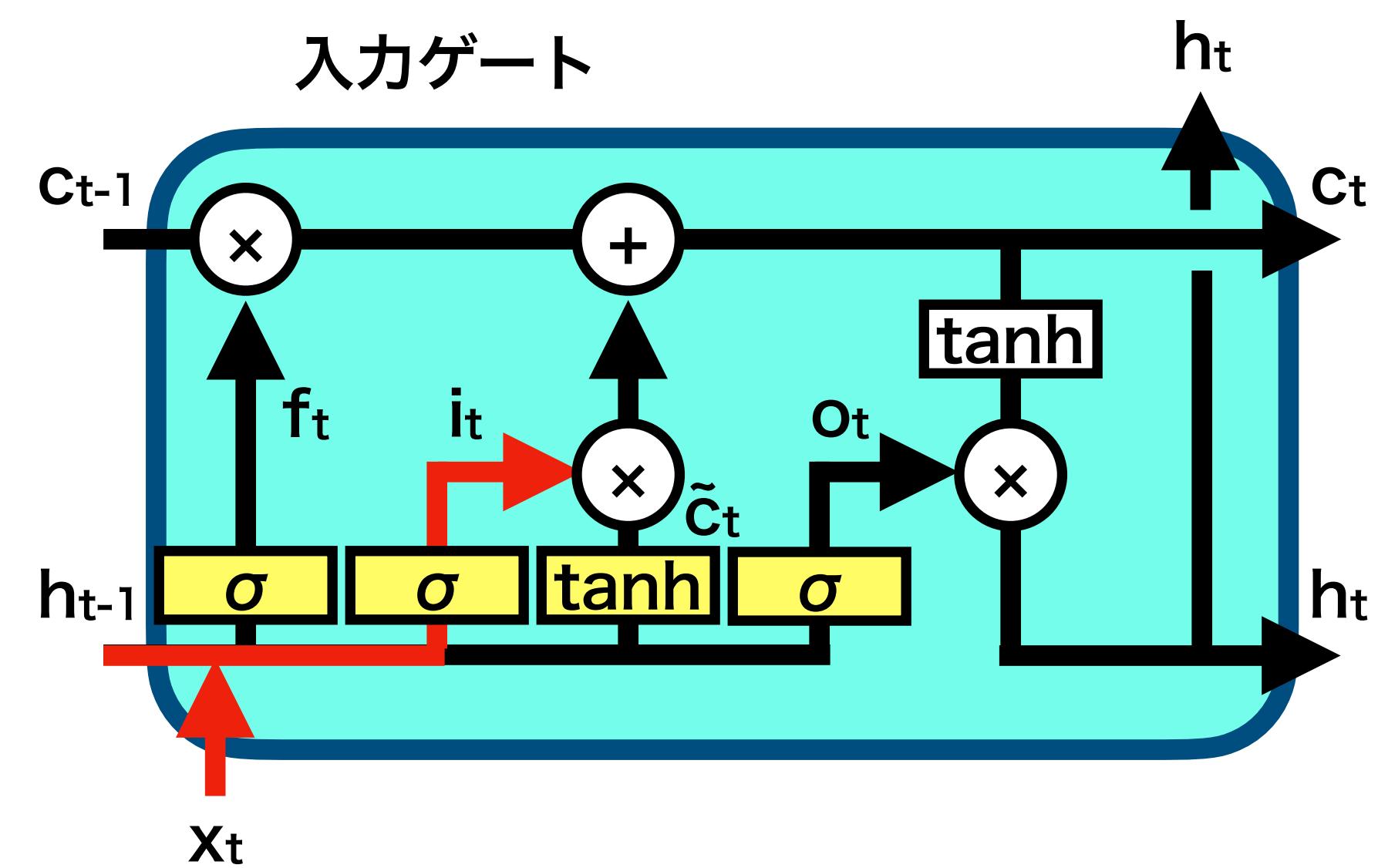
Many to One

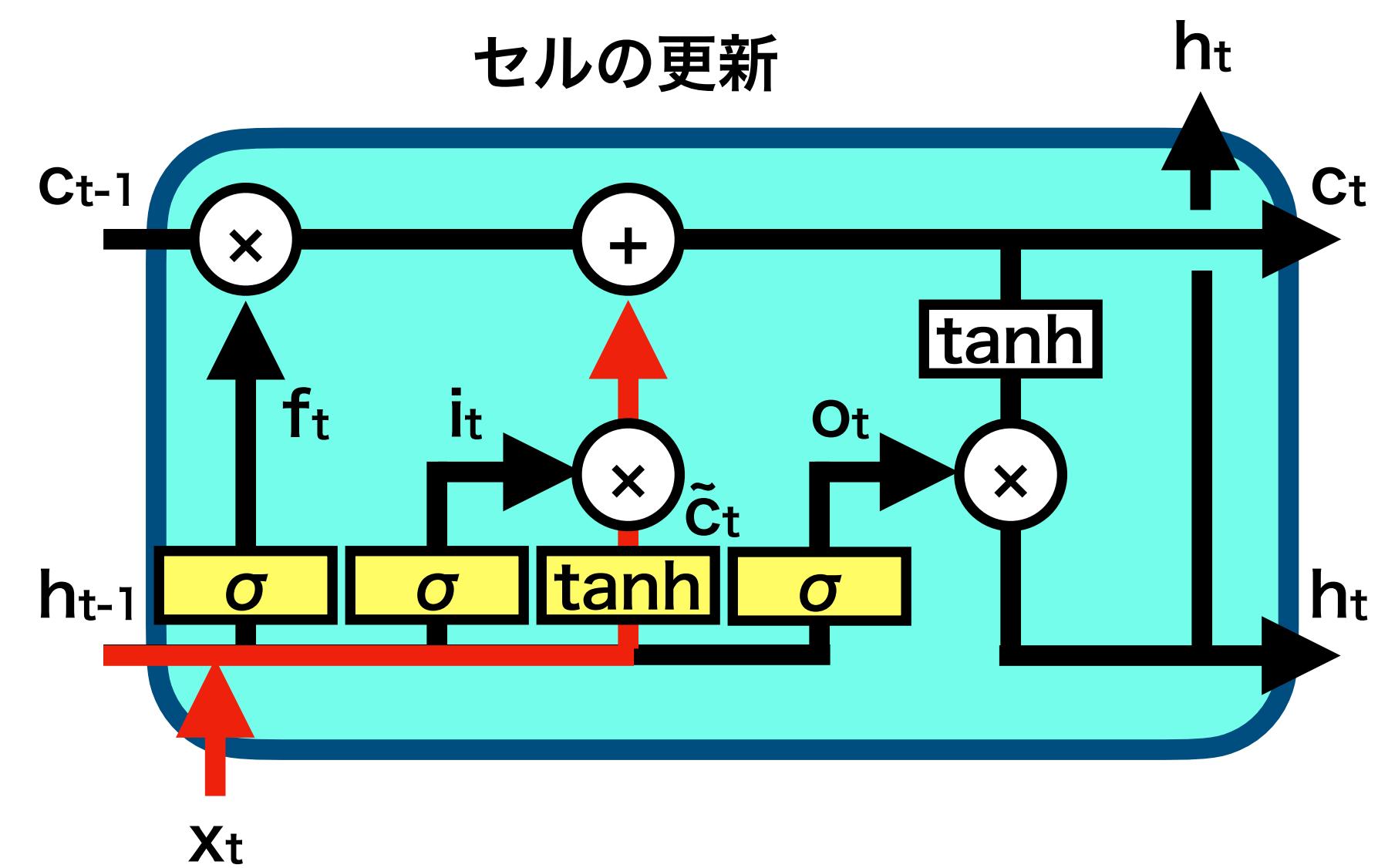


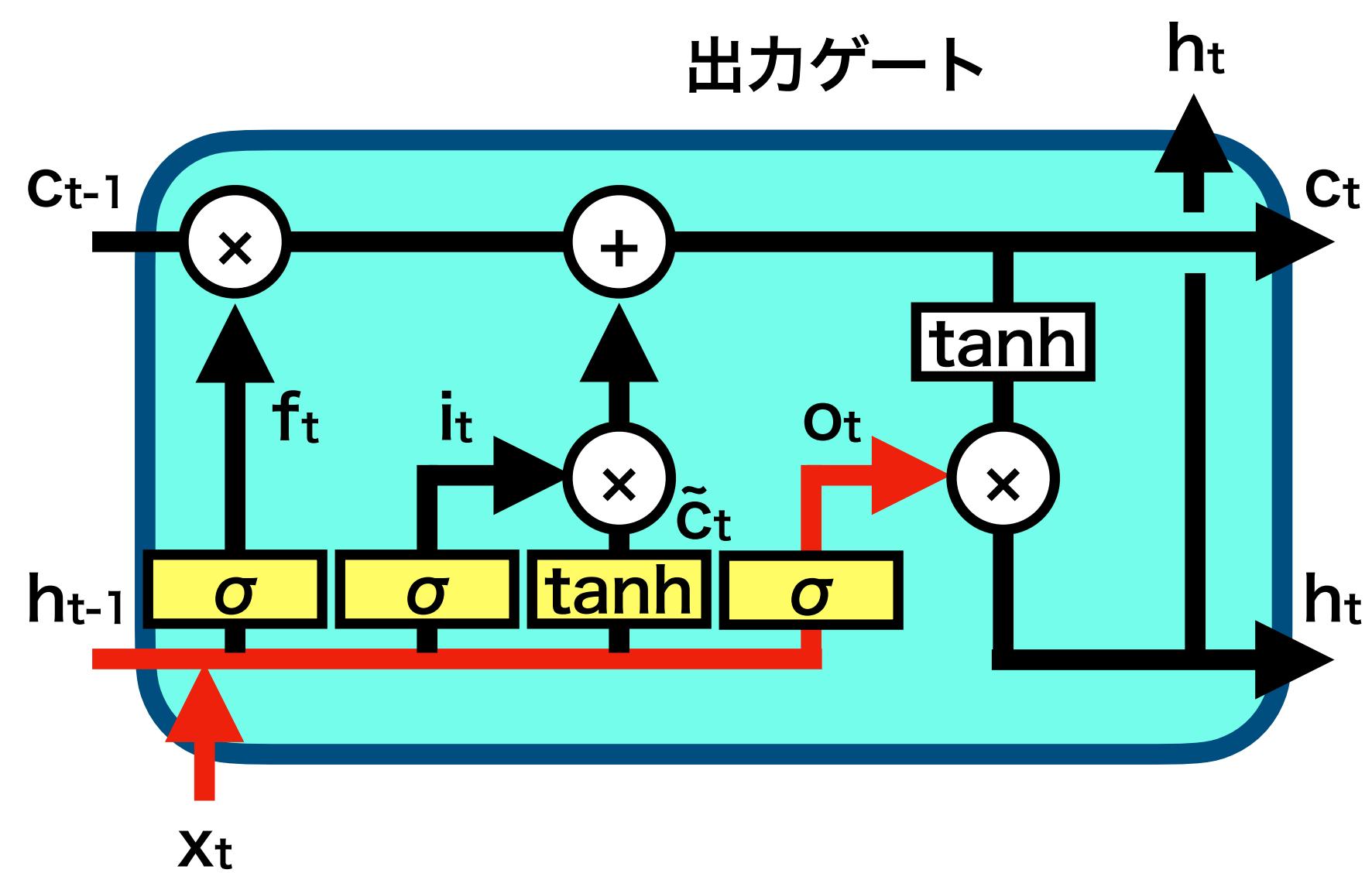


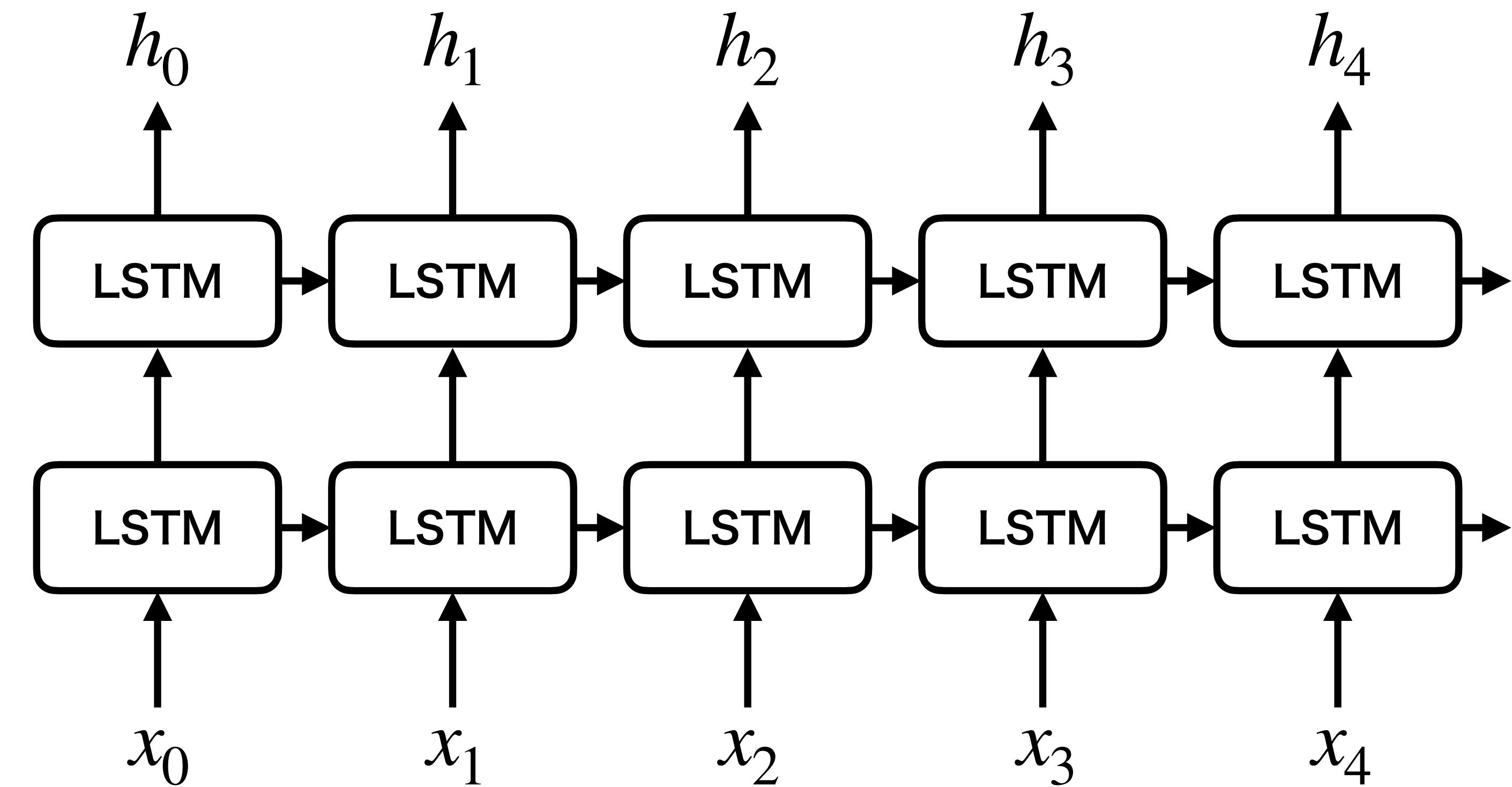


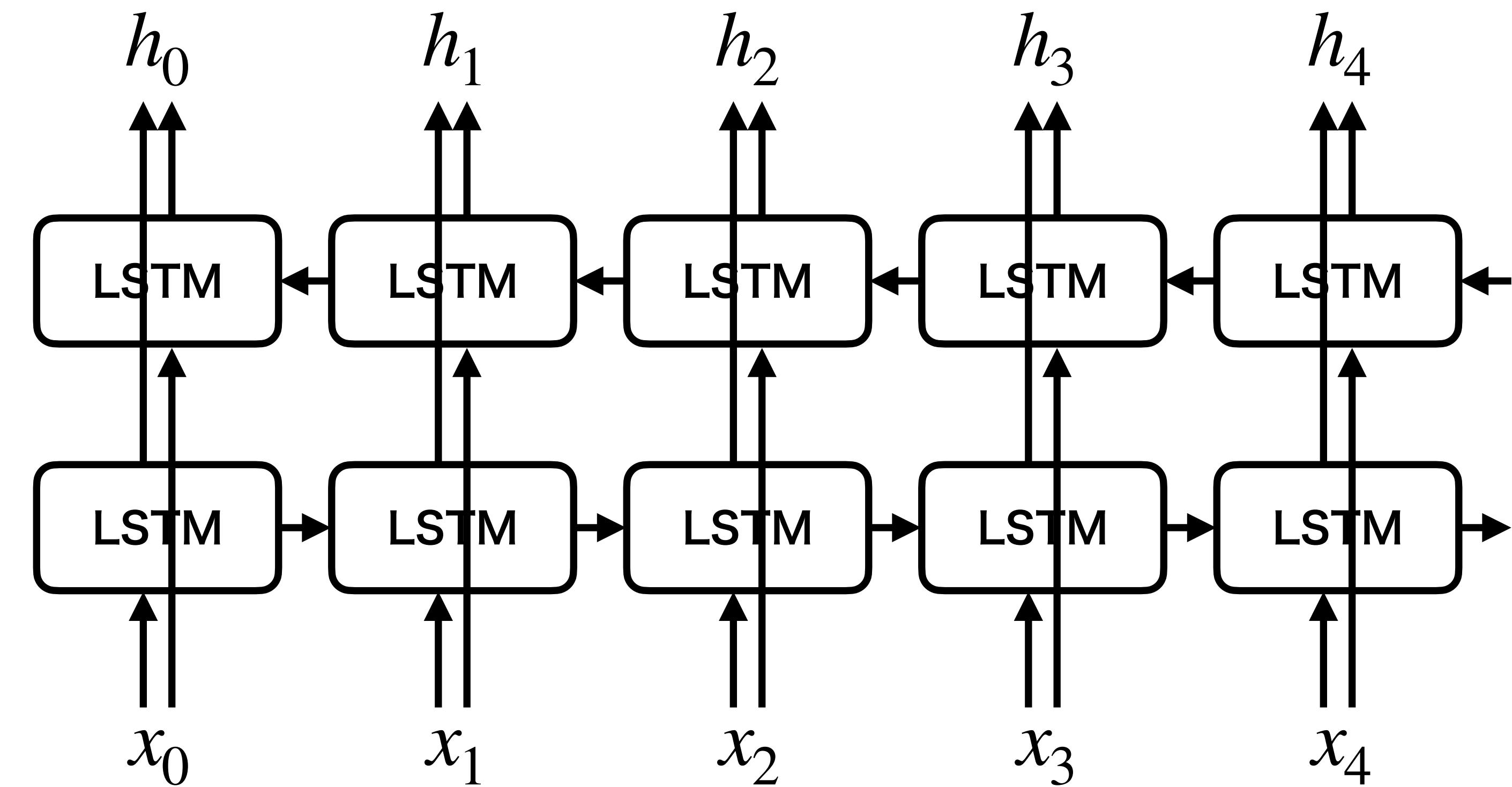


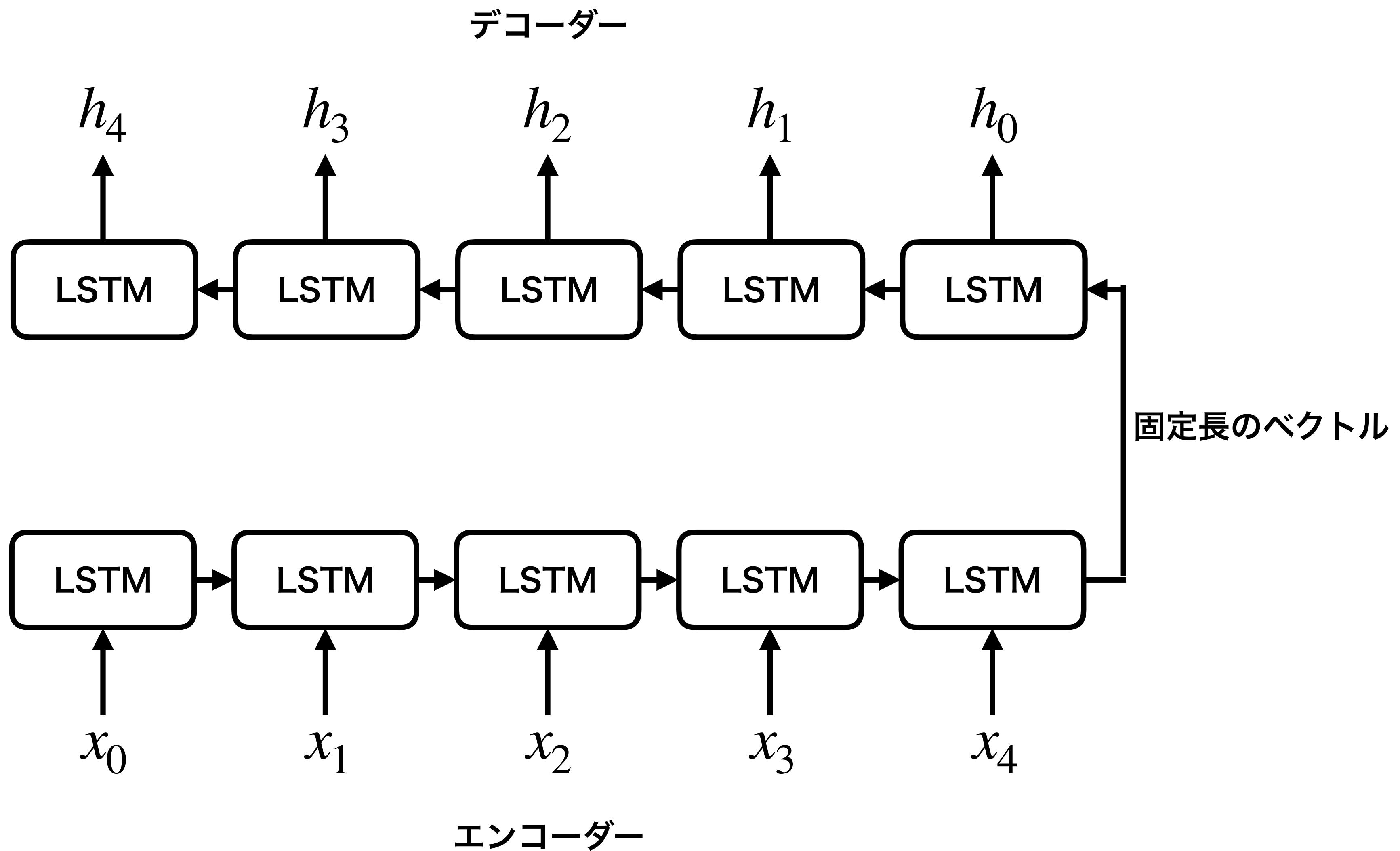


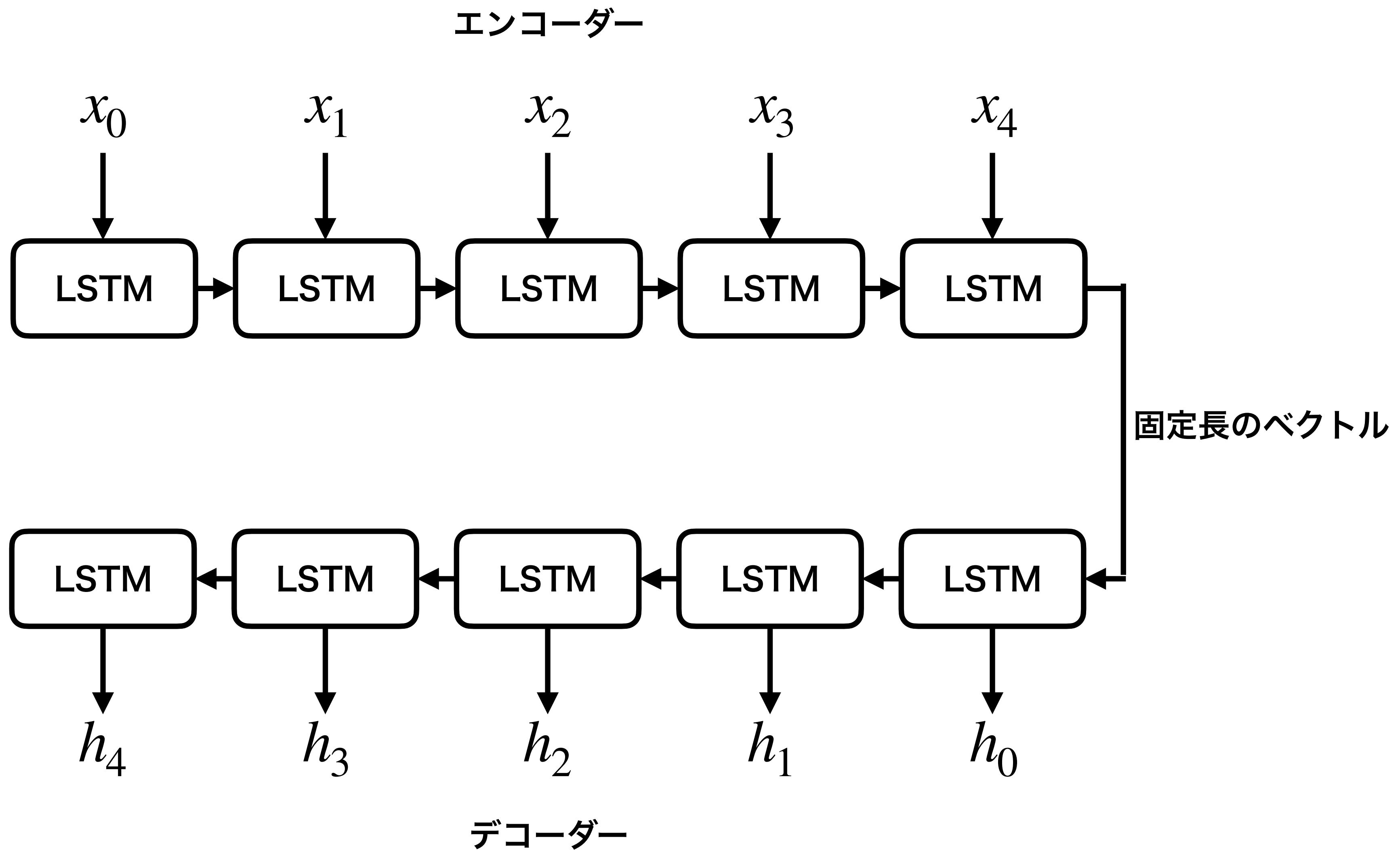


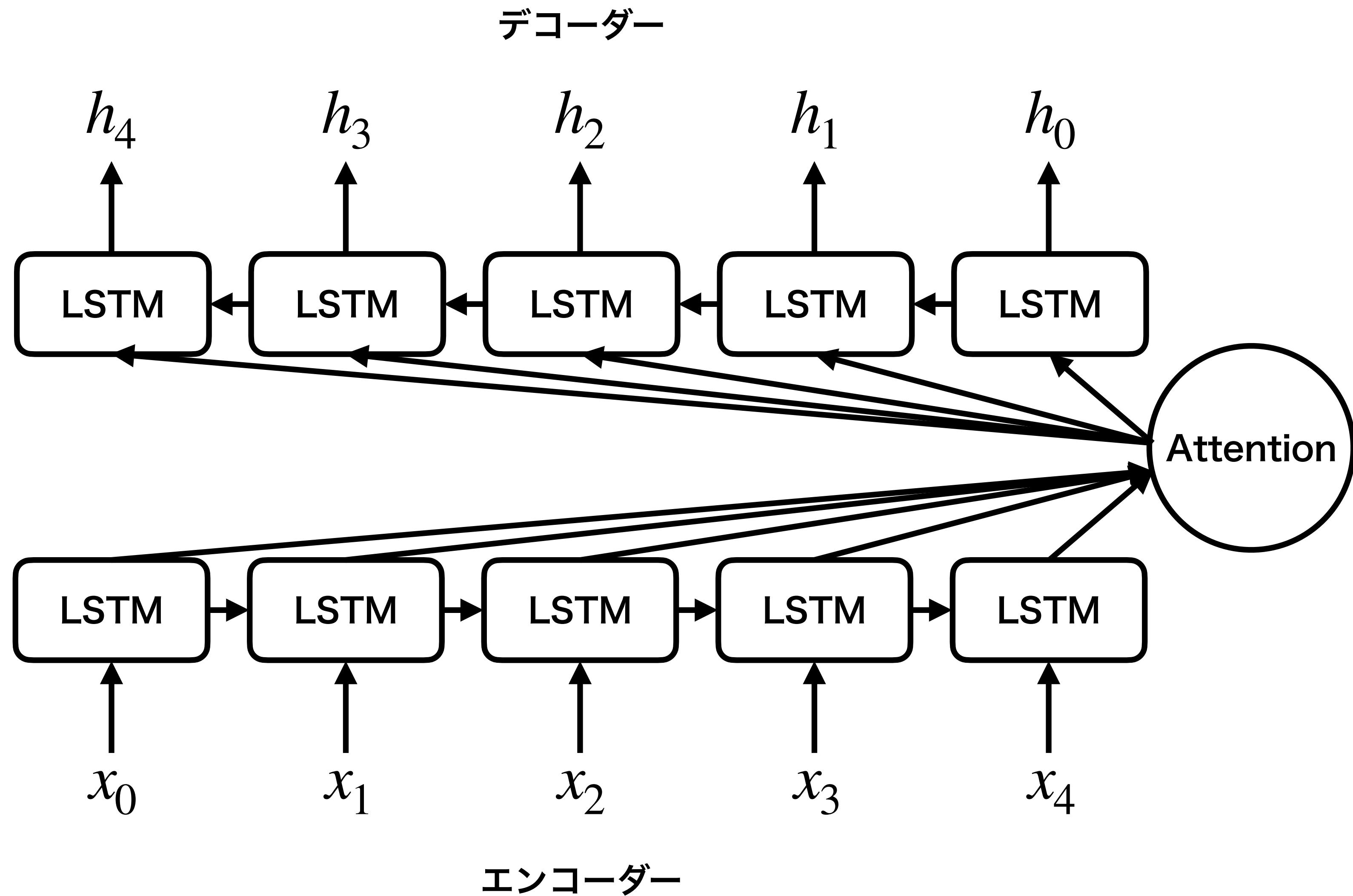


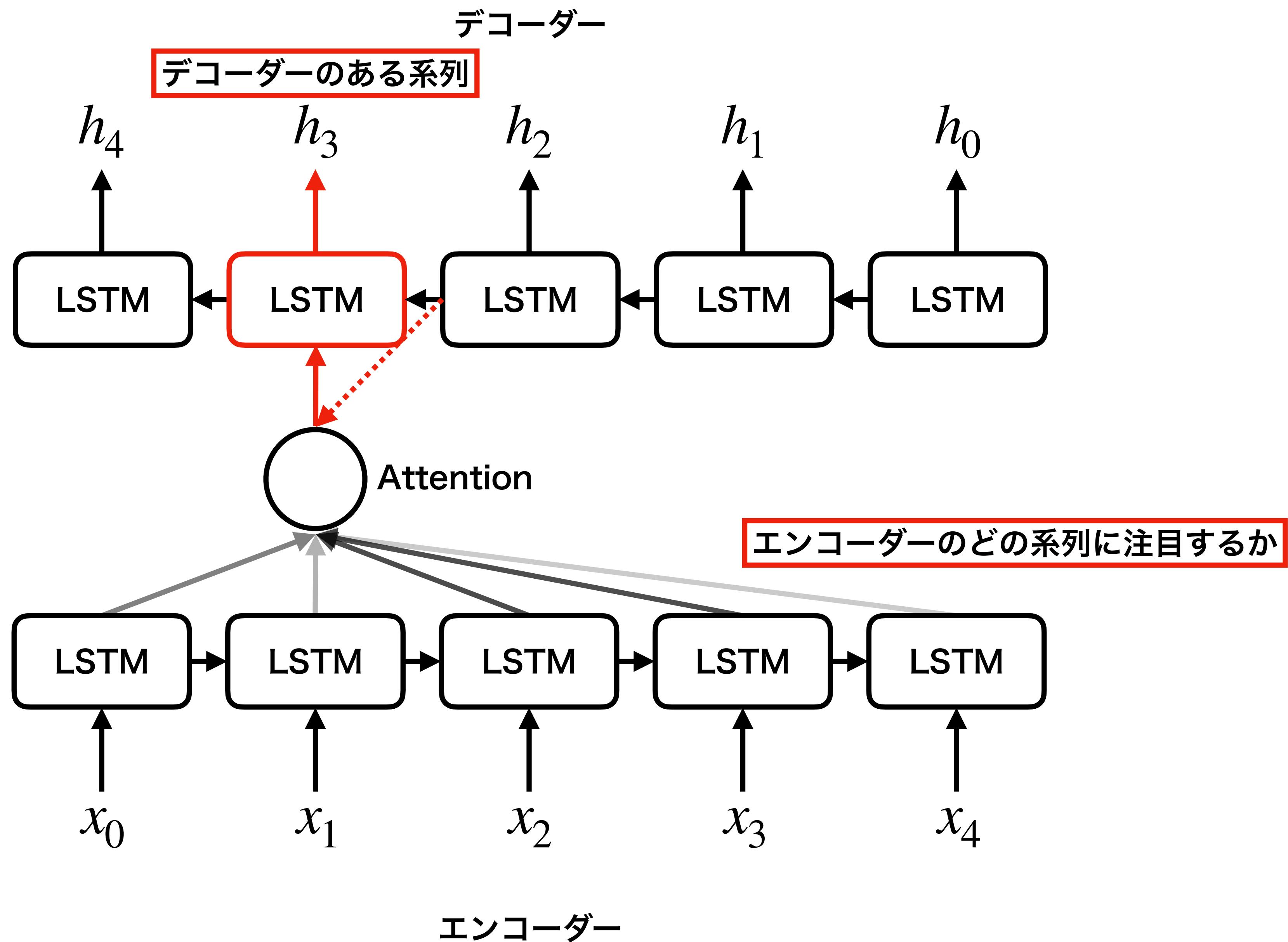


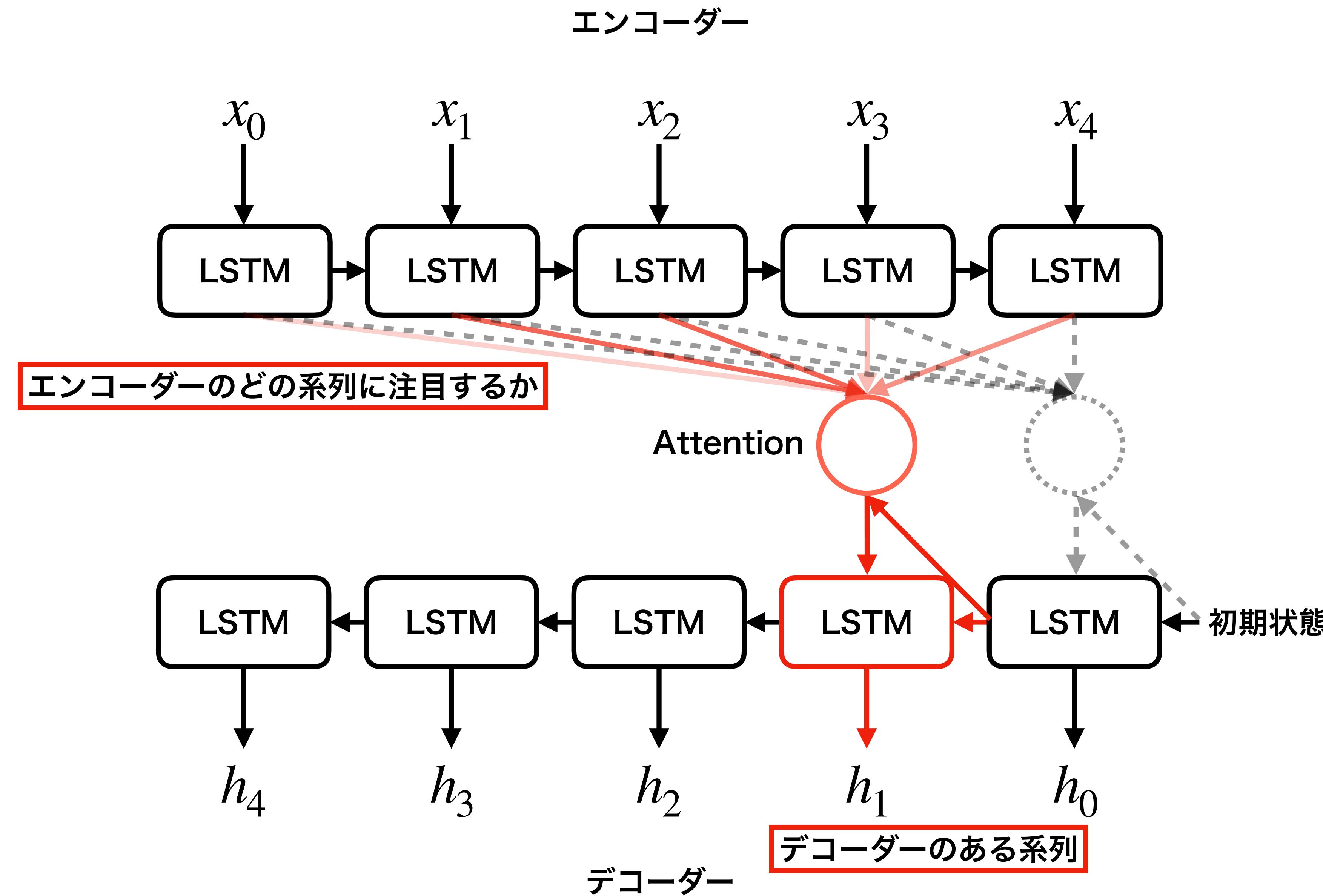




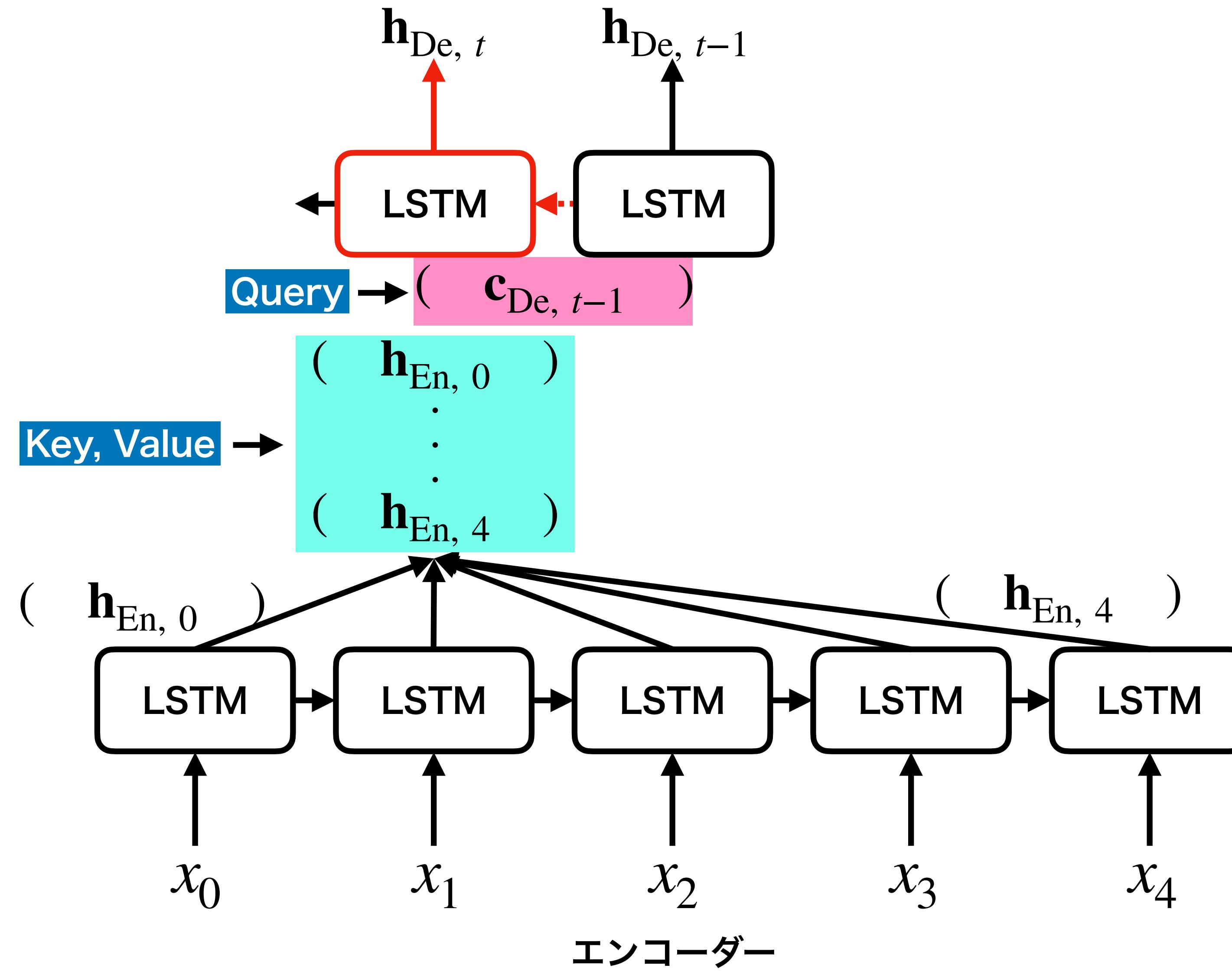


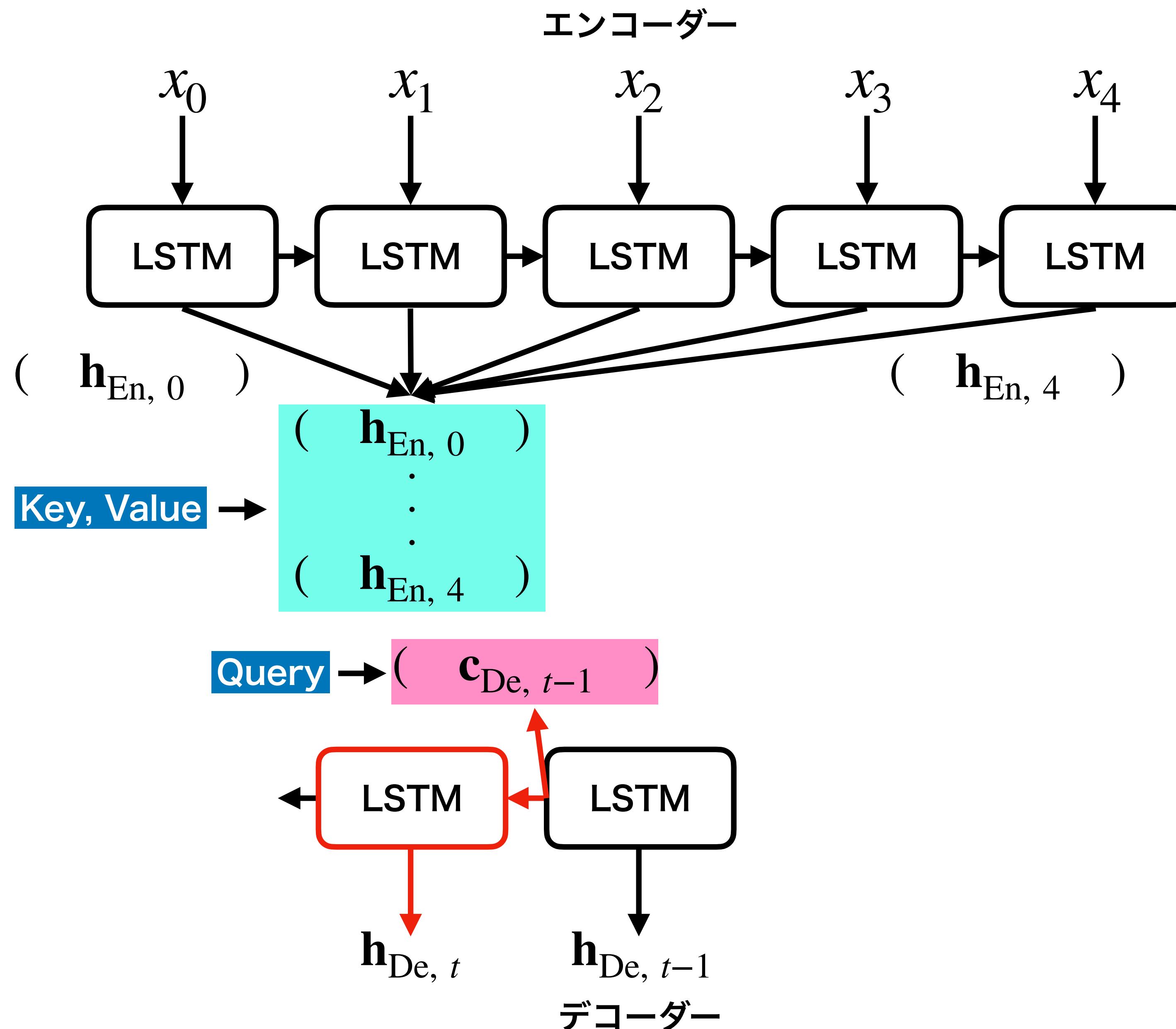




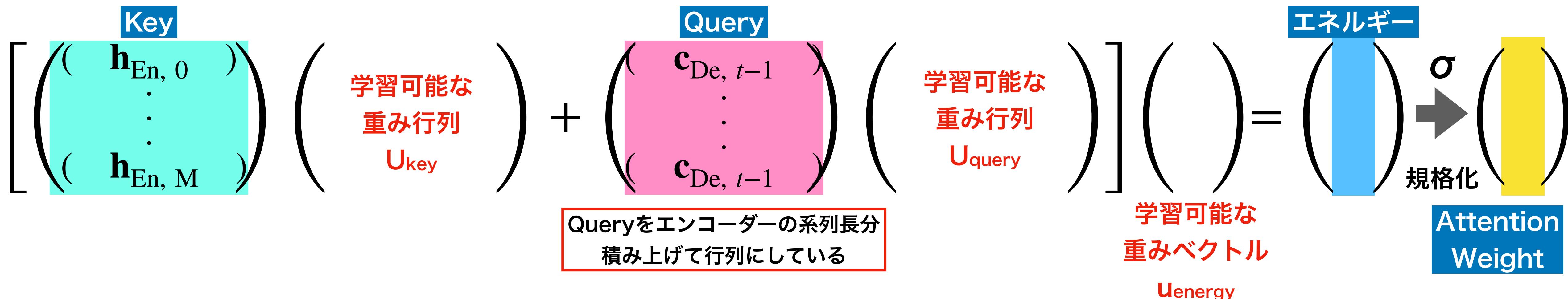


デコーダー

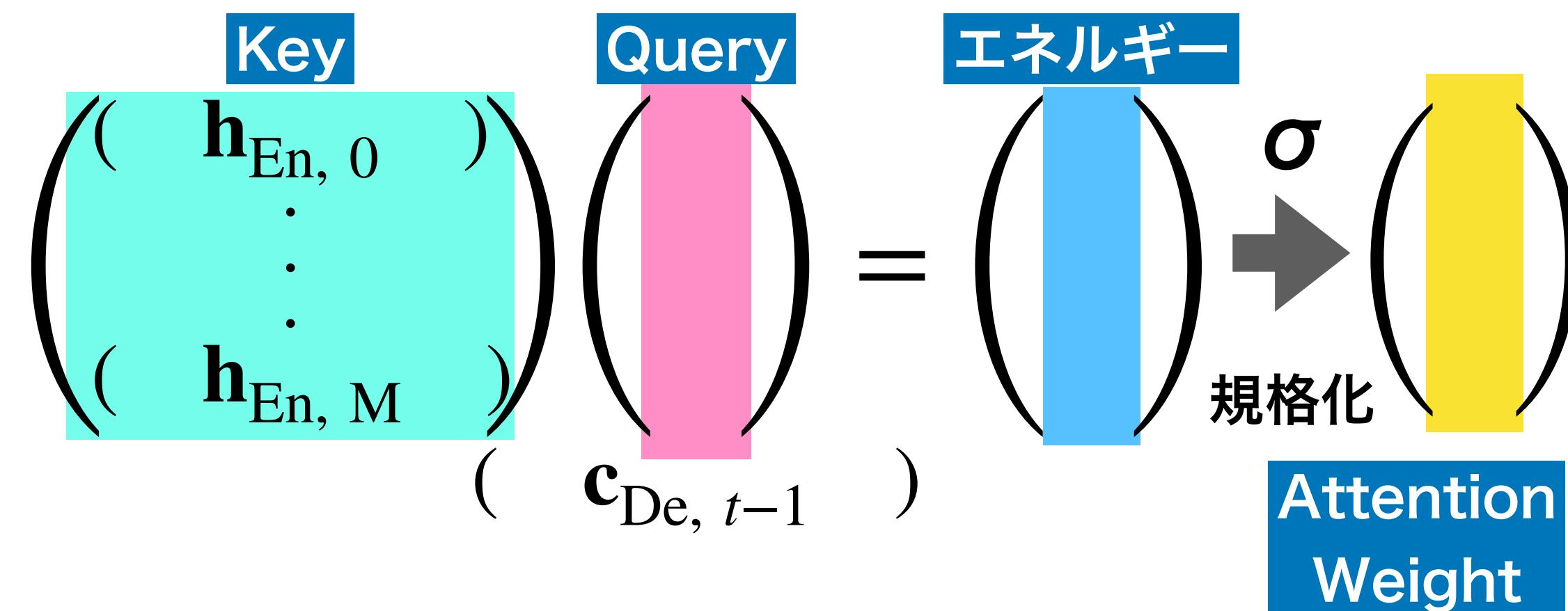




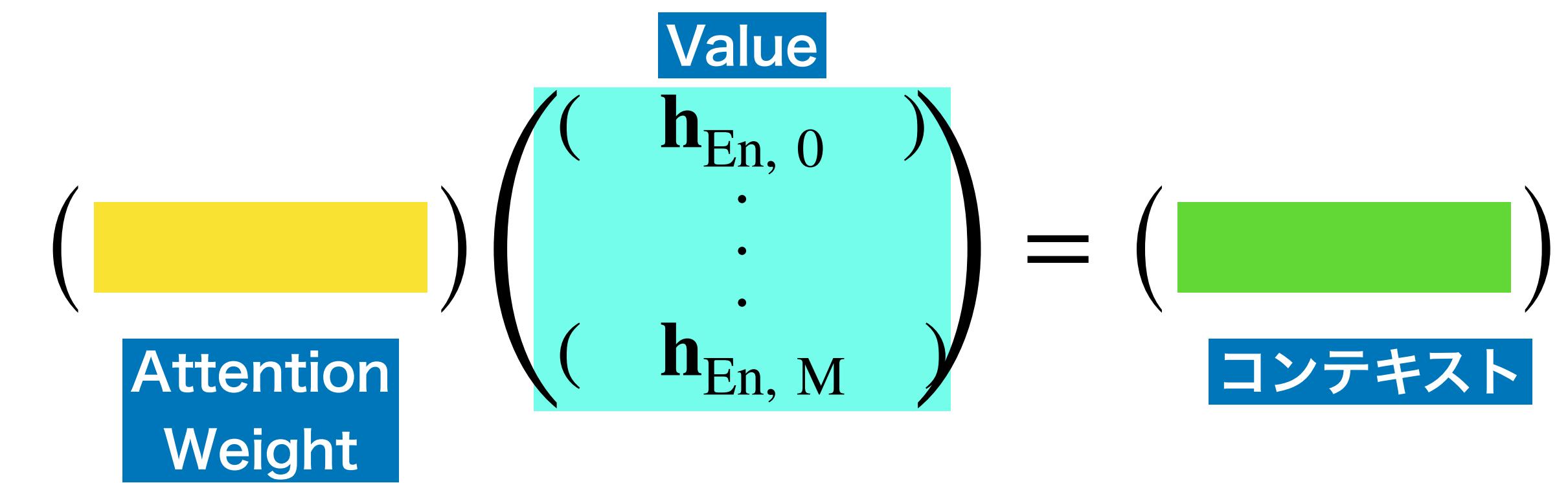
Additive Attention



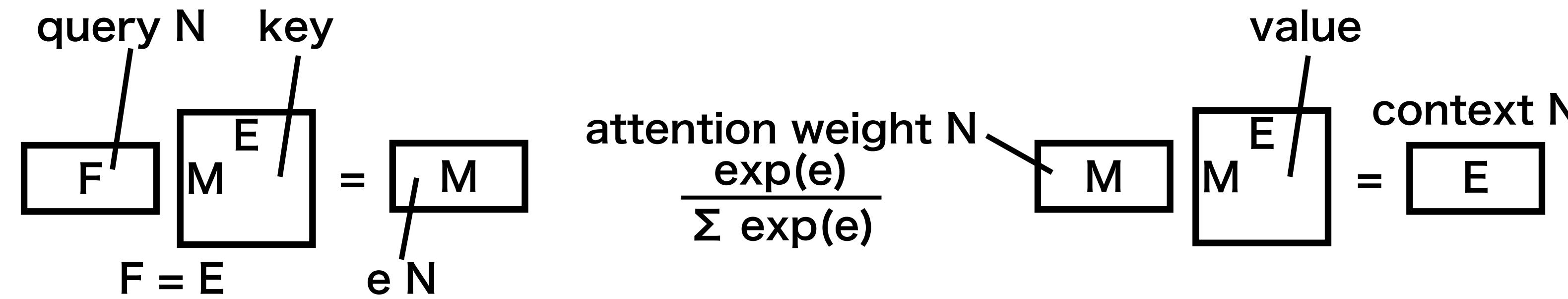
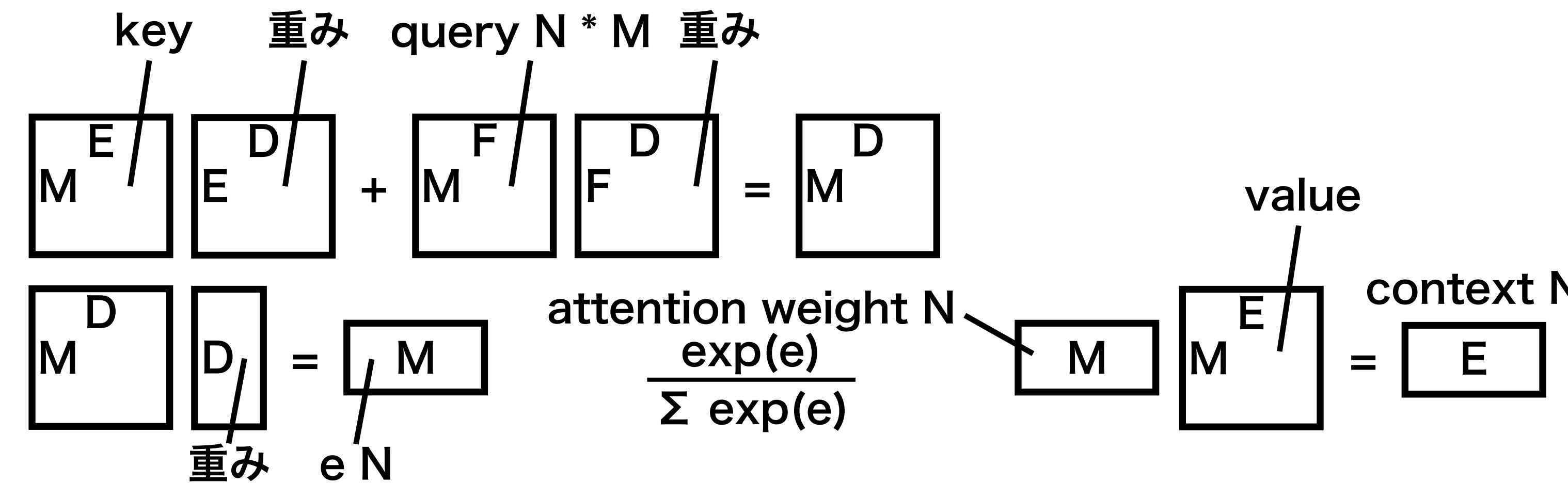
Dot-Product Attention

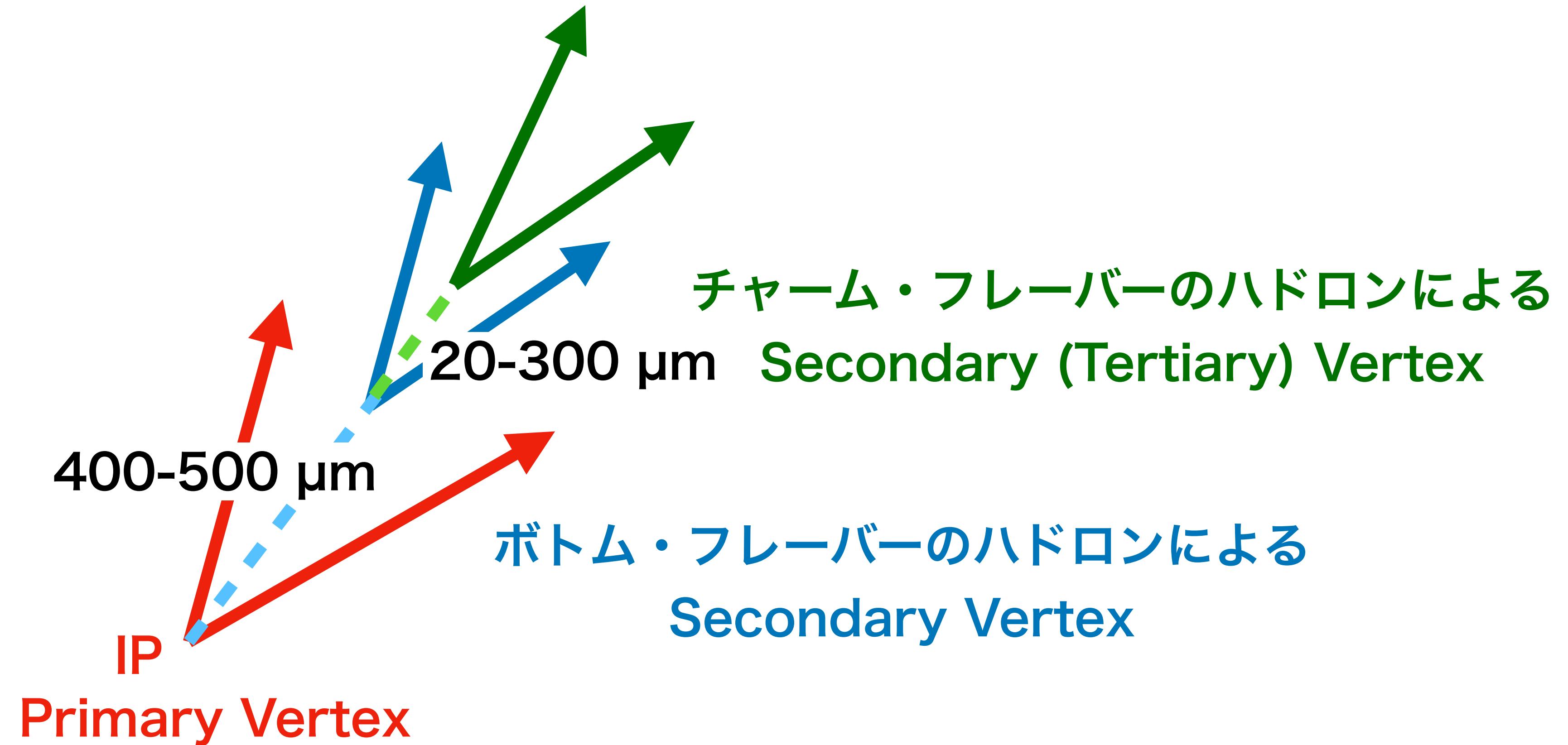


コンテキストの計算



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





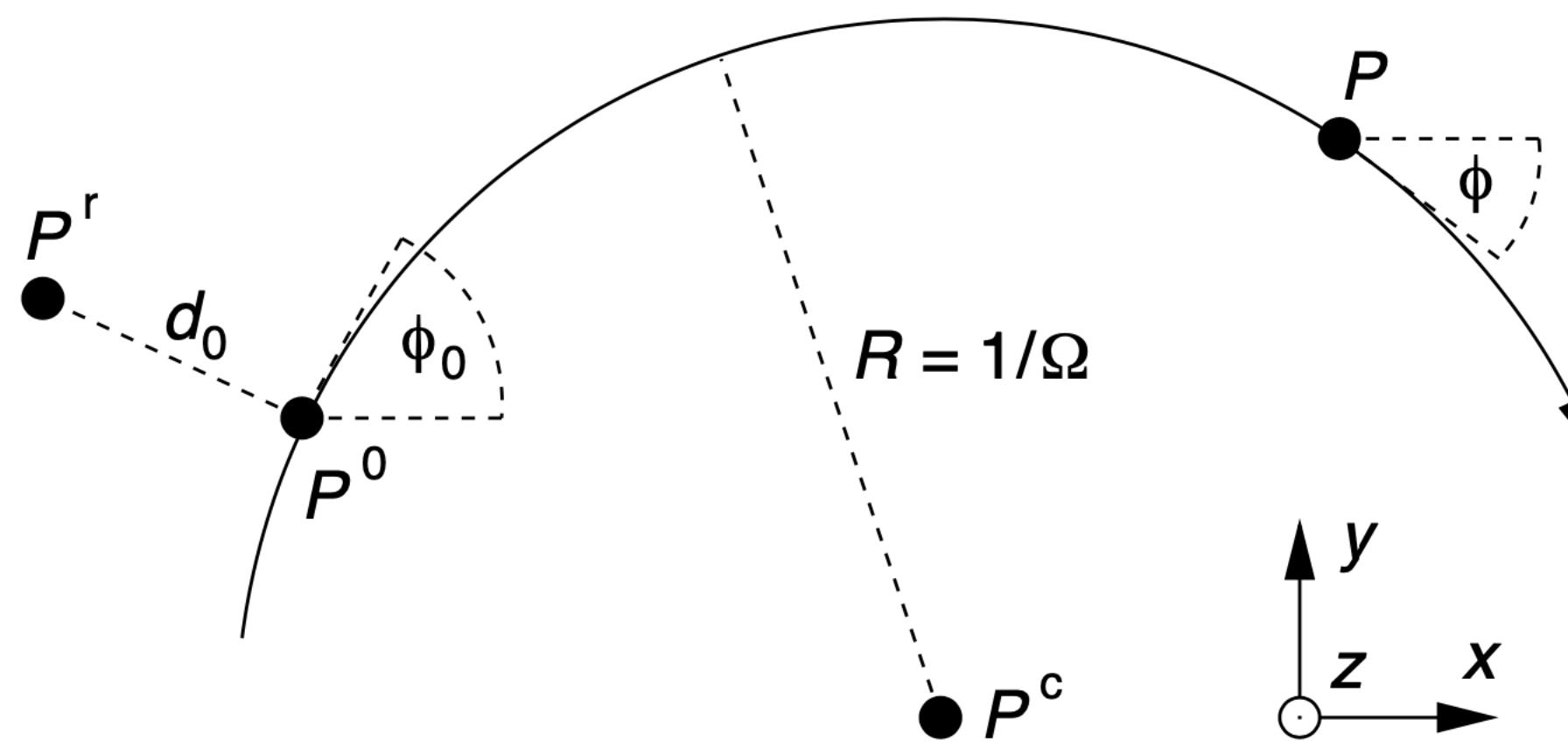


Figure 1: The projection of a helix segment in the xy plane is a part of an arc with centre \mathbf{P}^c and radius R . The direction of the particle is shown with the arrow at the arc. All track parameters are given relative to the reference point \mathbf{P}^r .

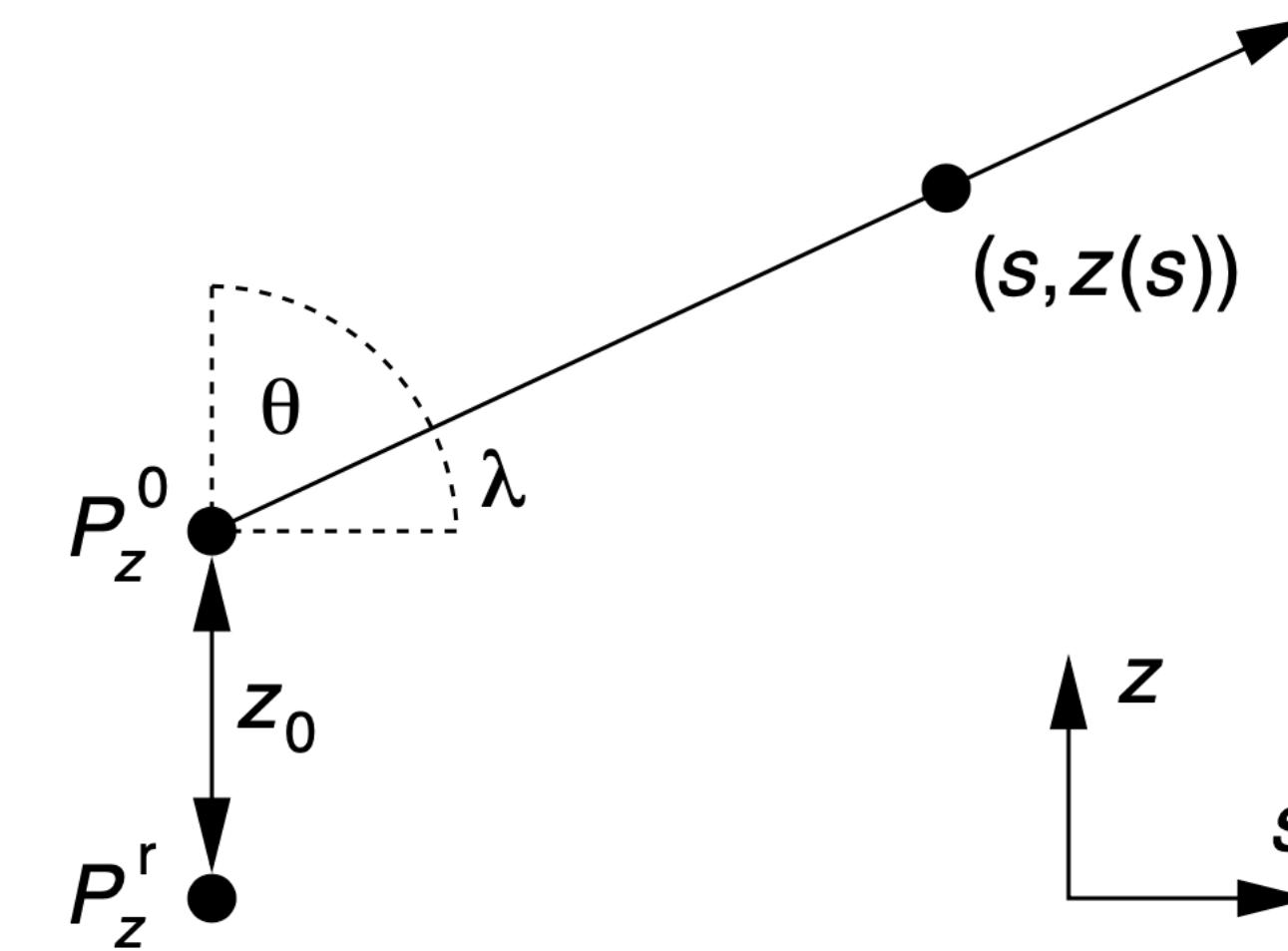
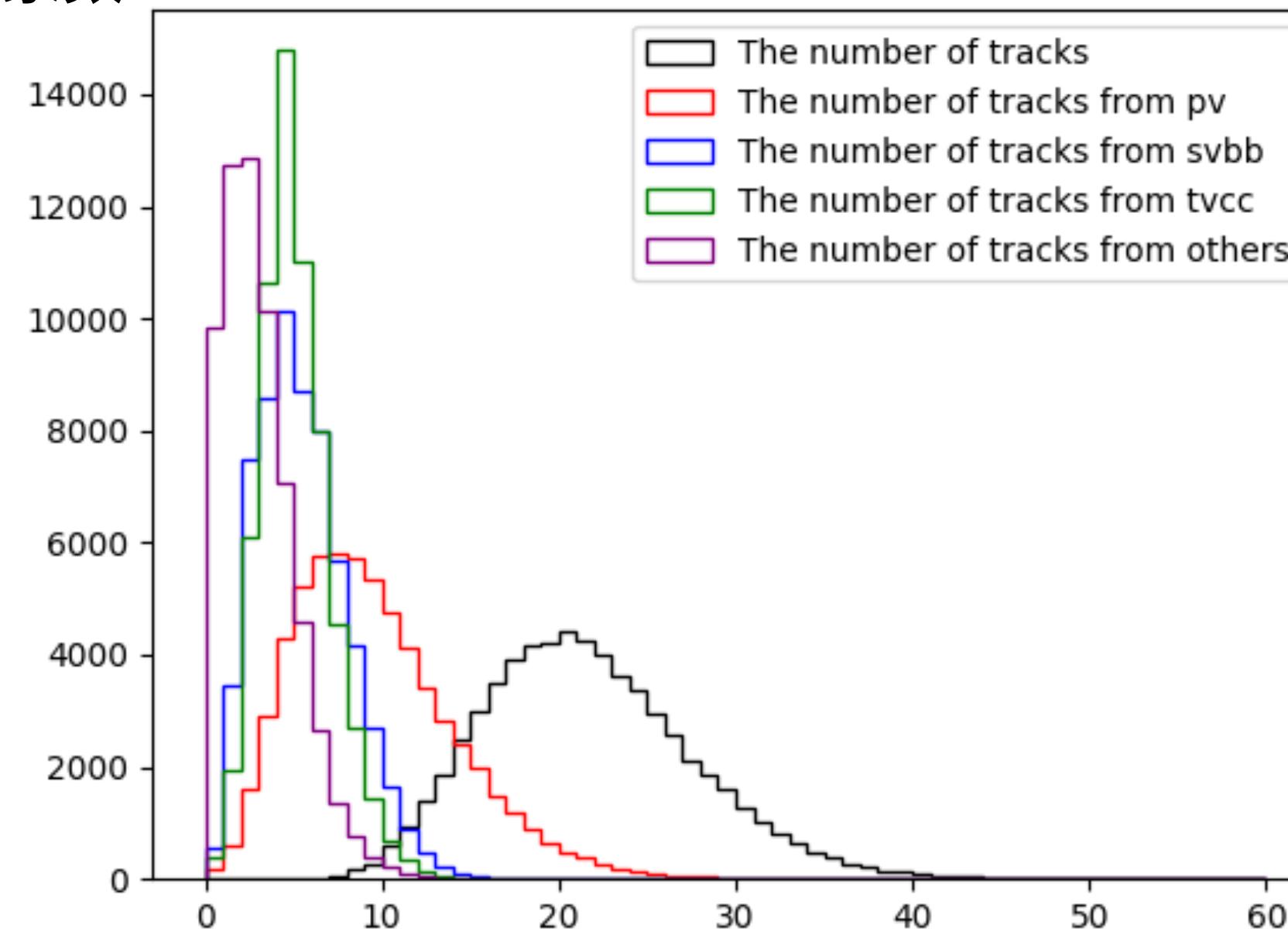
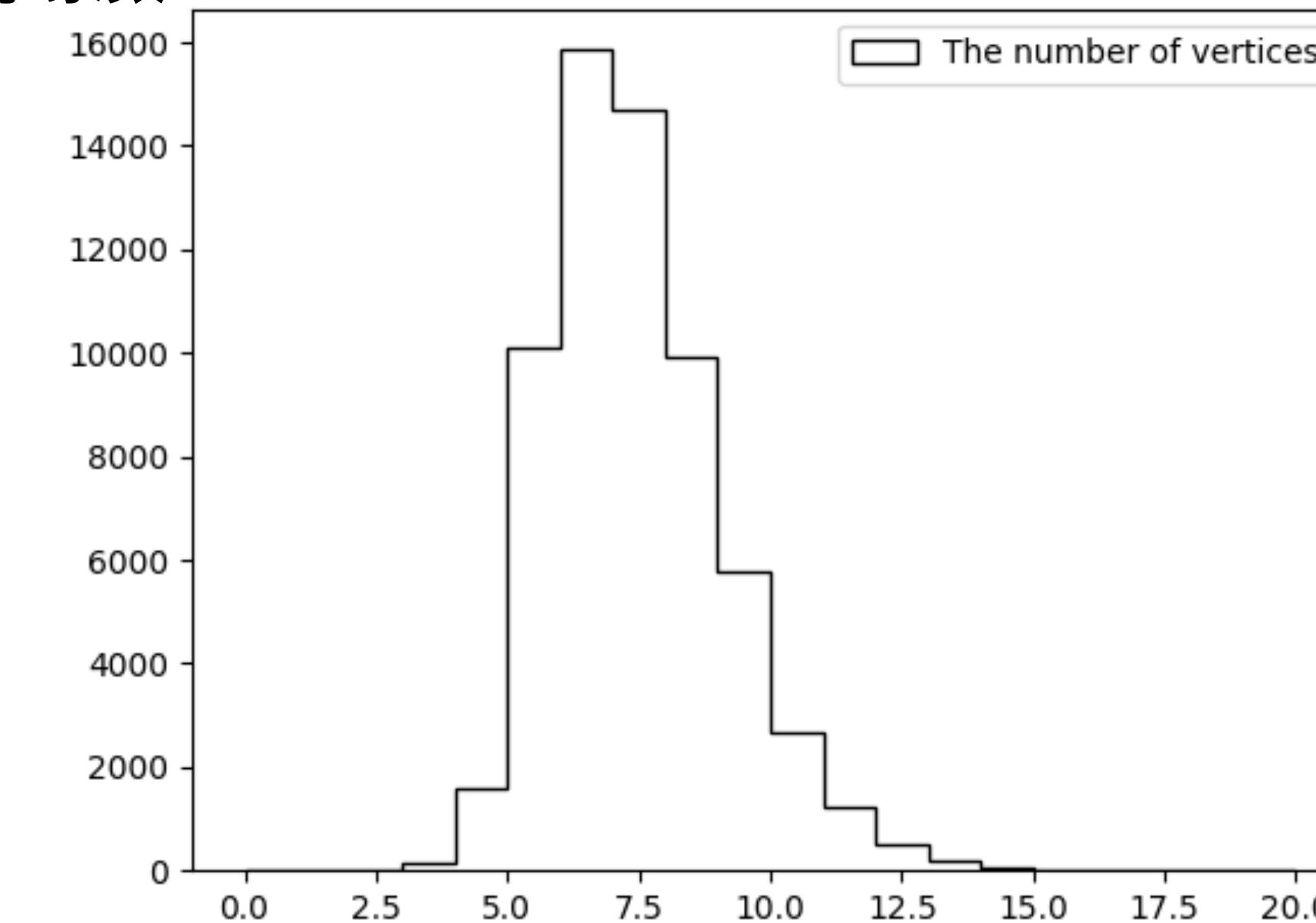


Figure 2: The projection of a helix in the sz plane is a straight line (see Eq. 10). The variable s at a point \mathbf{P} is the arc length in the xy plane from \mathbf{P}^0 to \mathbf{P} . This also implies that $s = 0$, if $z = z_0$.

事象数

飛跡数（終状態 $b\bar{b}$ ）

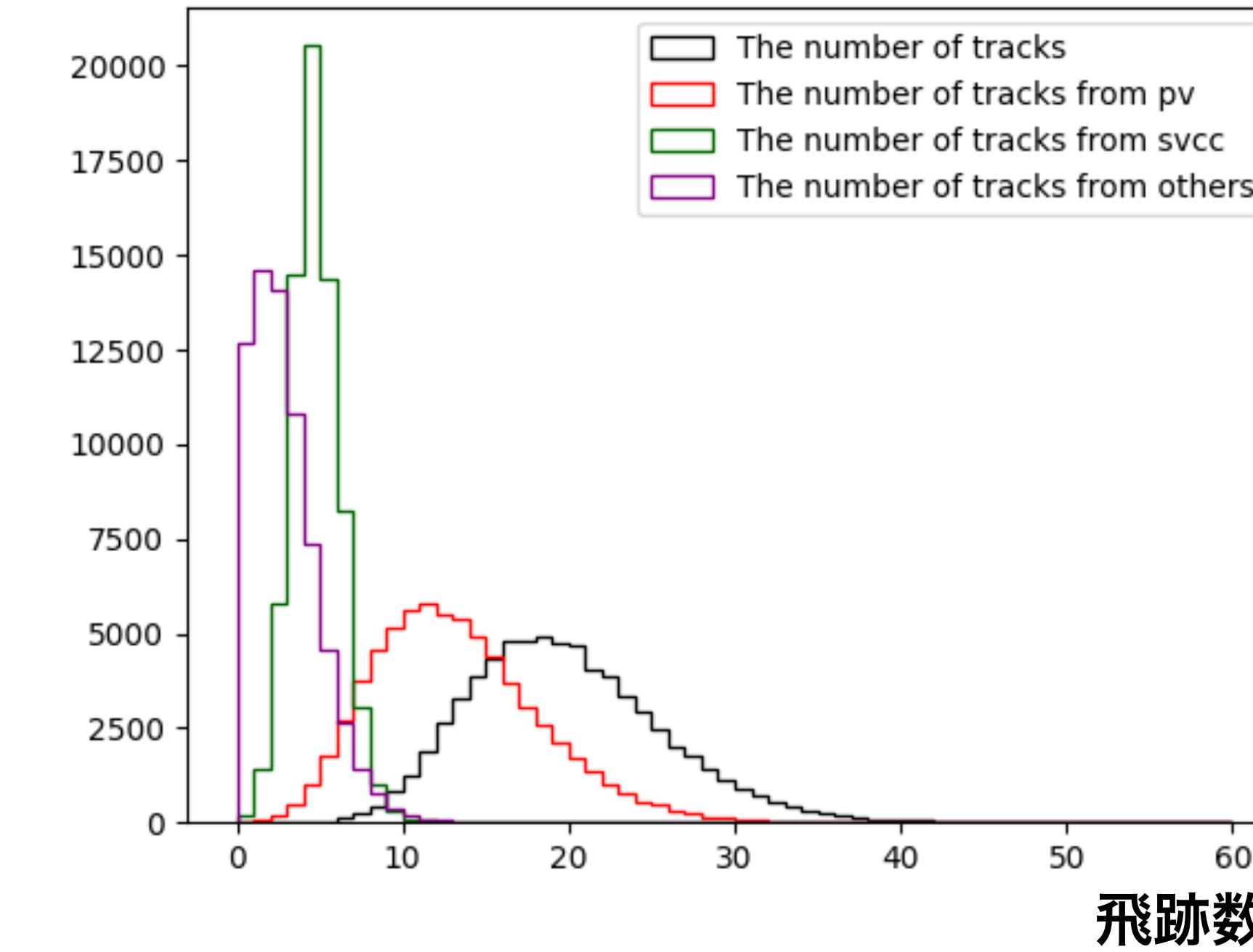
事象数

崩壊点数（終状態 $b\bar{b}$ ）

事象数

飛跡数（終状態 $c\bar{c}$ ）

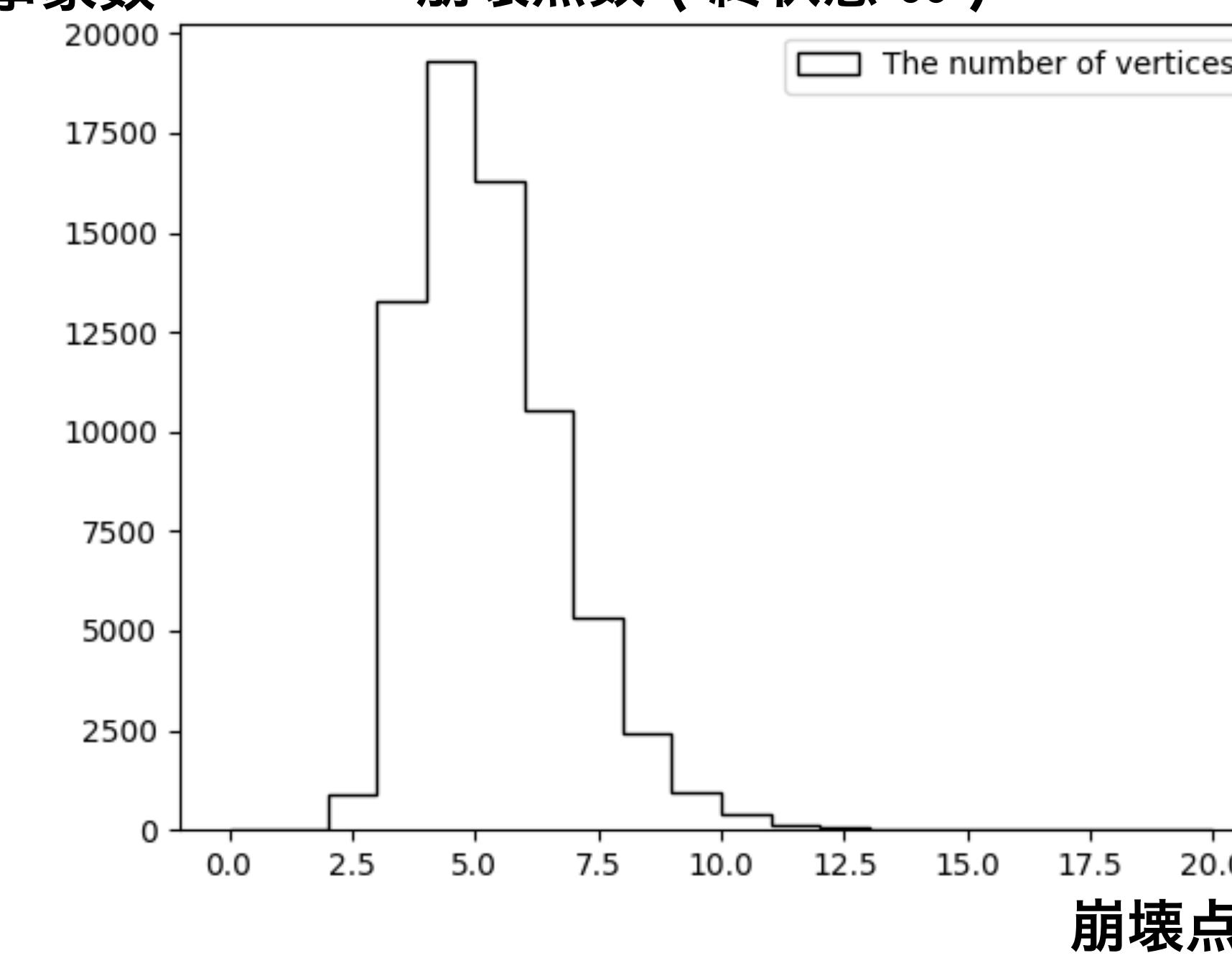
飛跡数



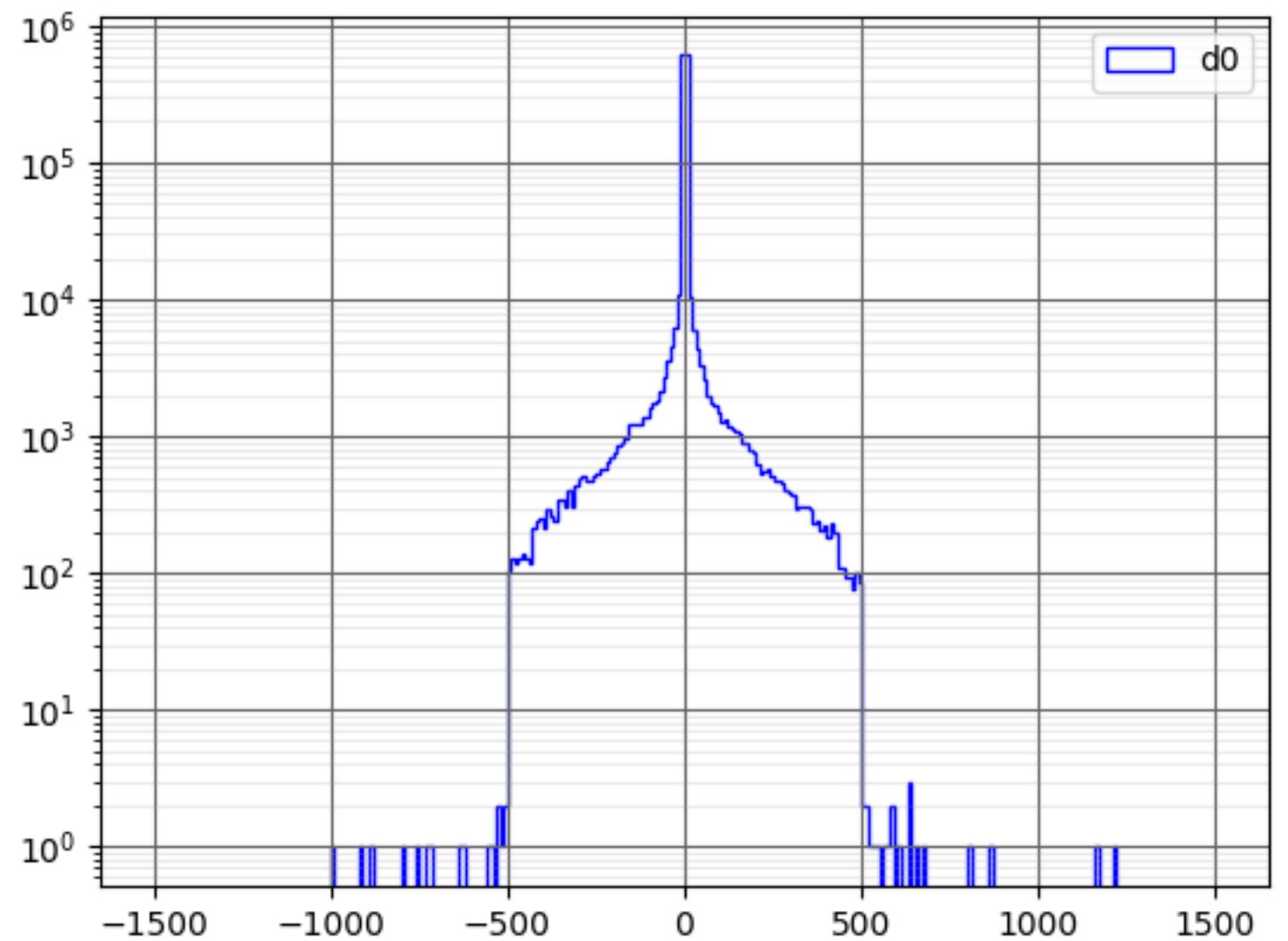
事象数

崩壊点数（終状態 $c\bar{c}$ ）

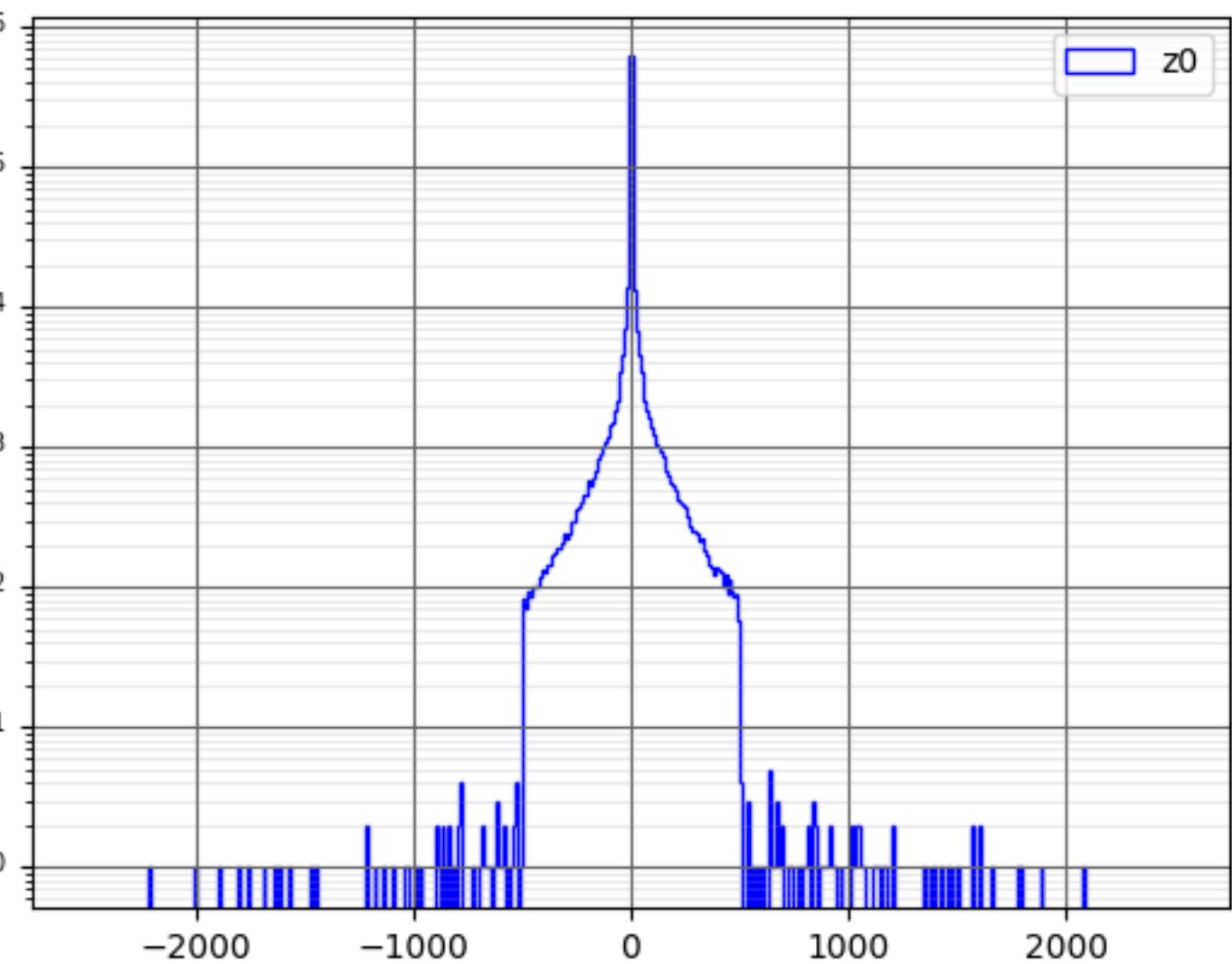
崩壊点数



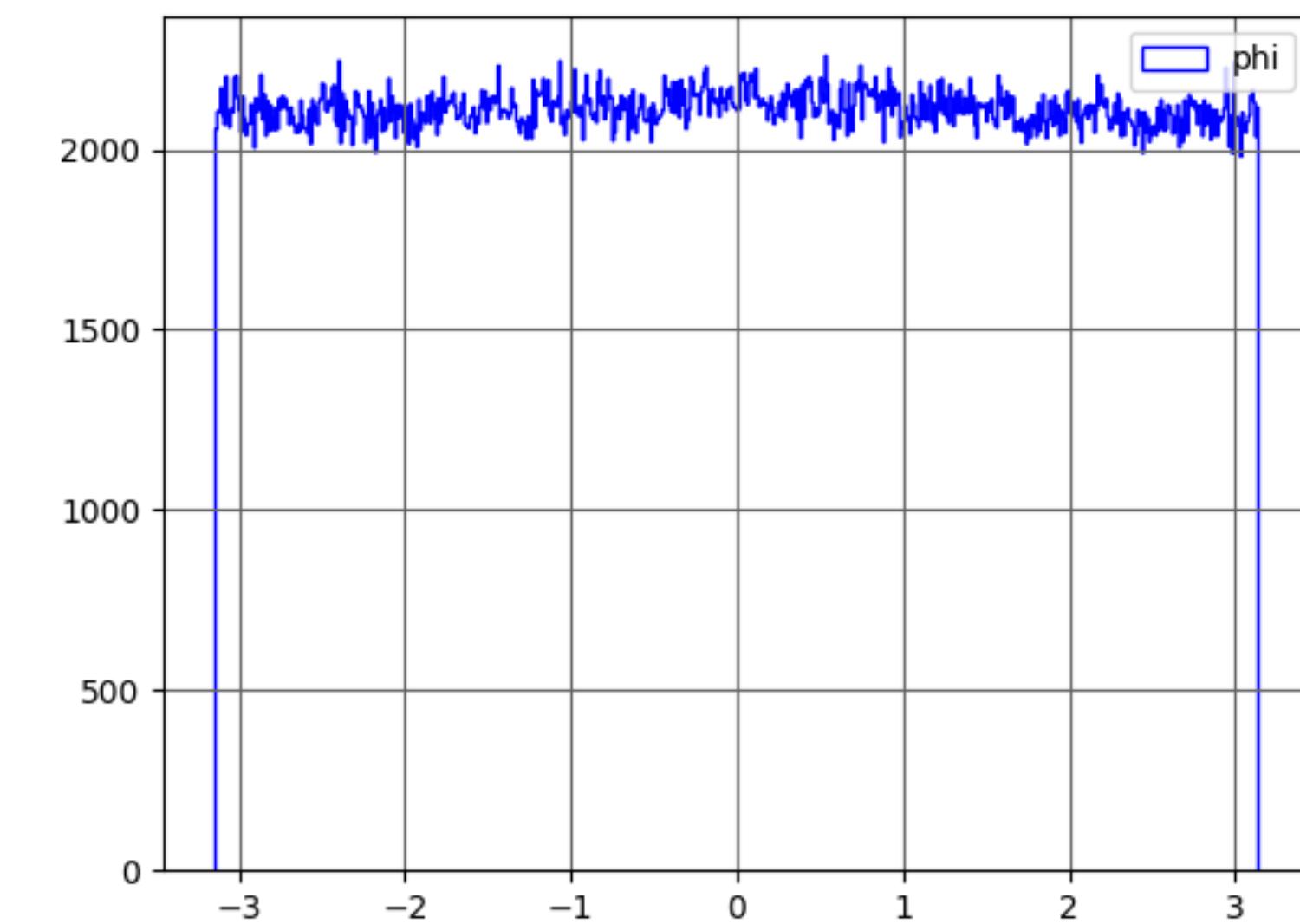
終狀態 $b\bar{b}$



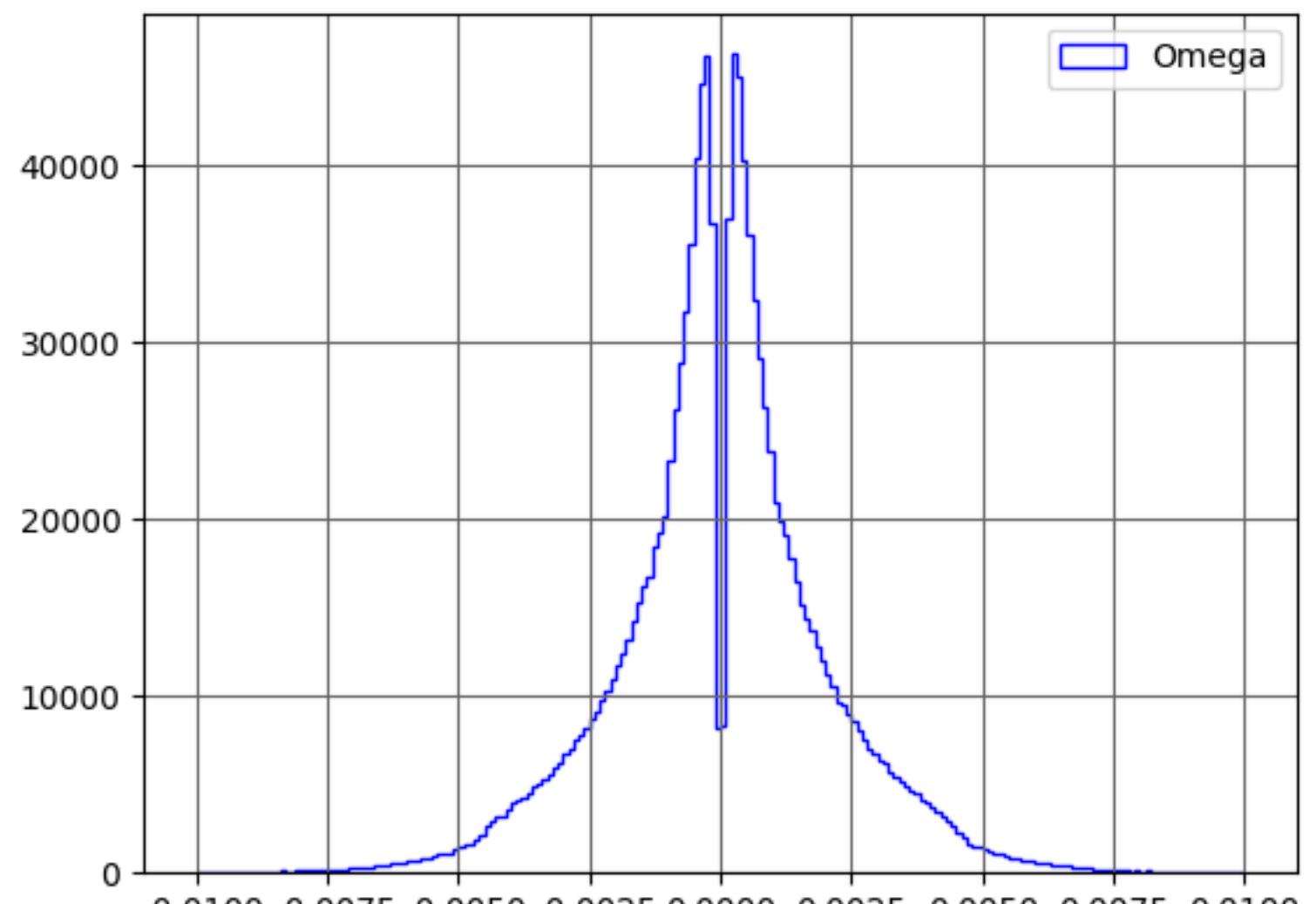
d_0



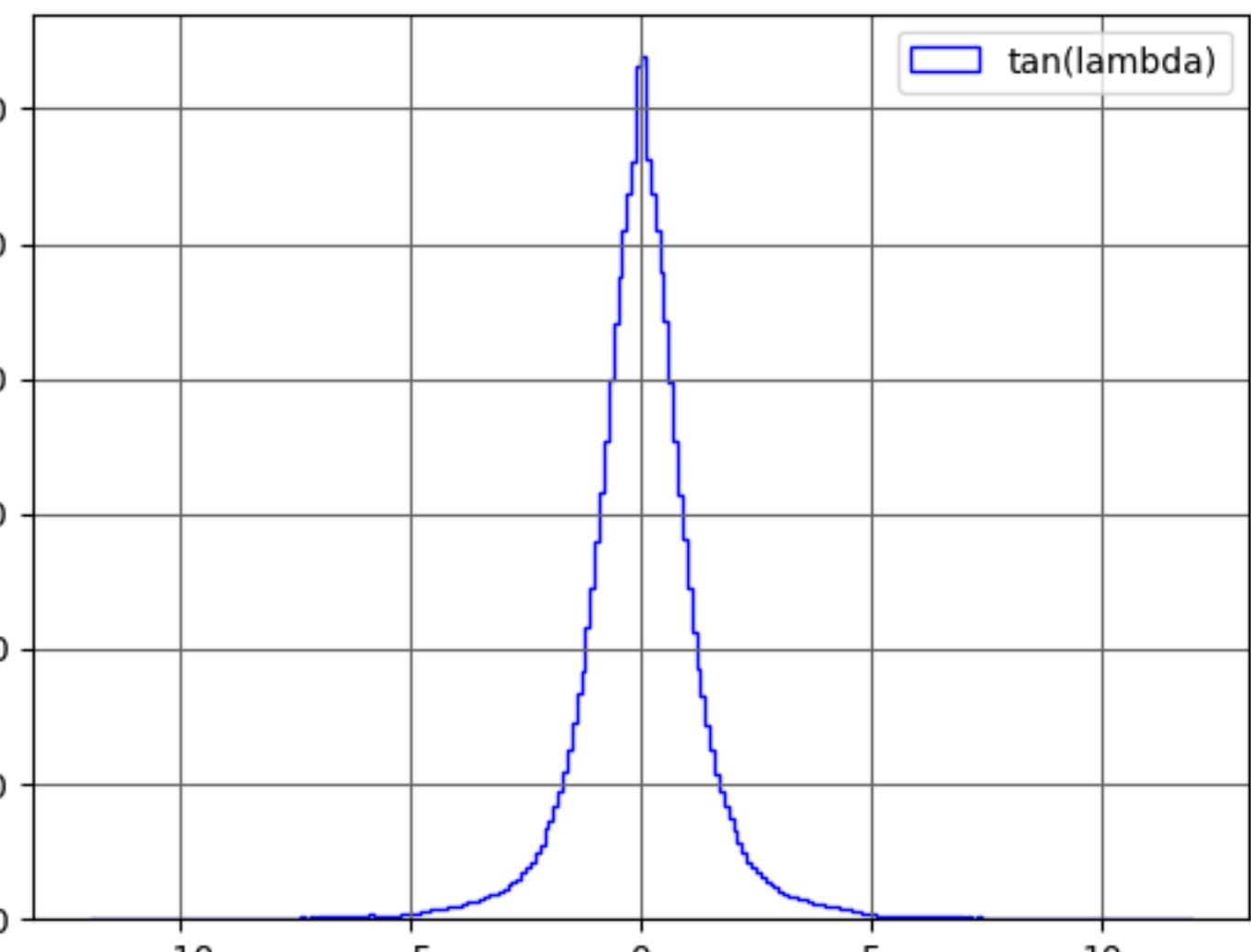
z_0



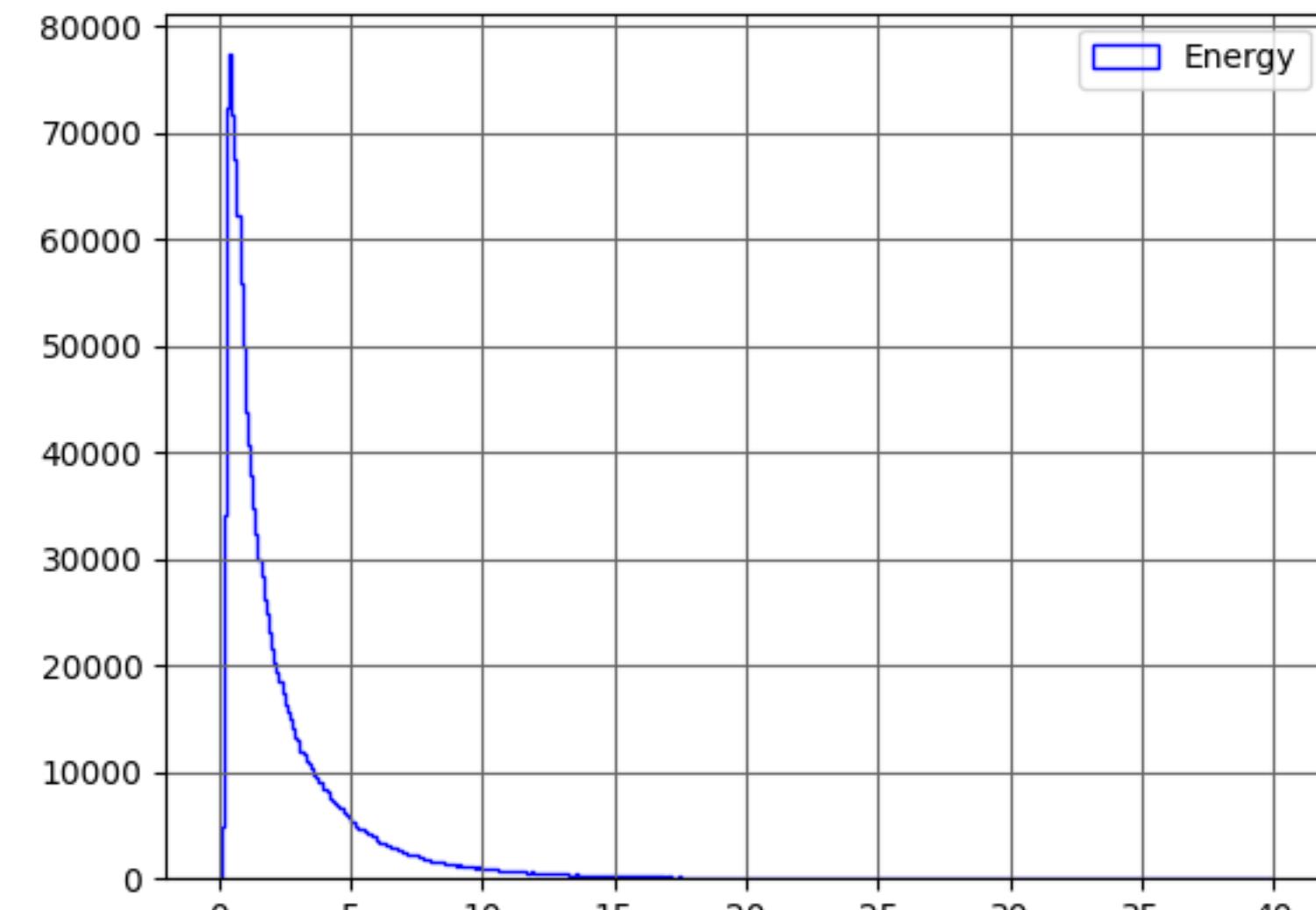
ϕ



Ω

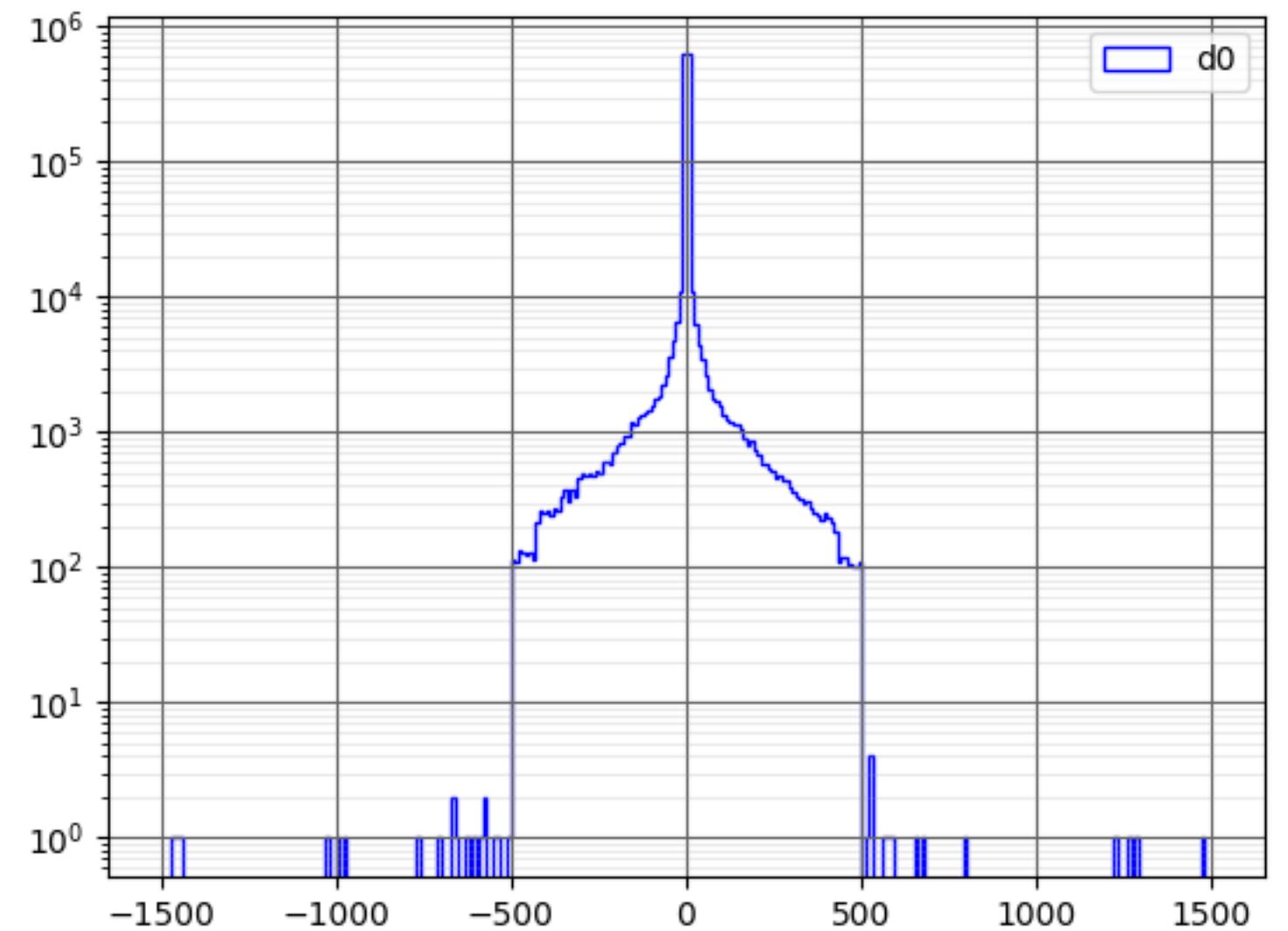


$\tan(\lambda)$

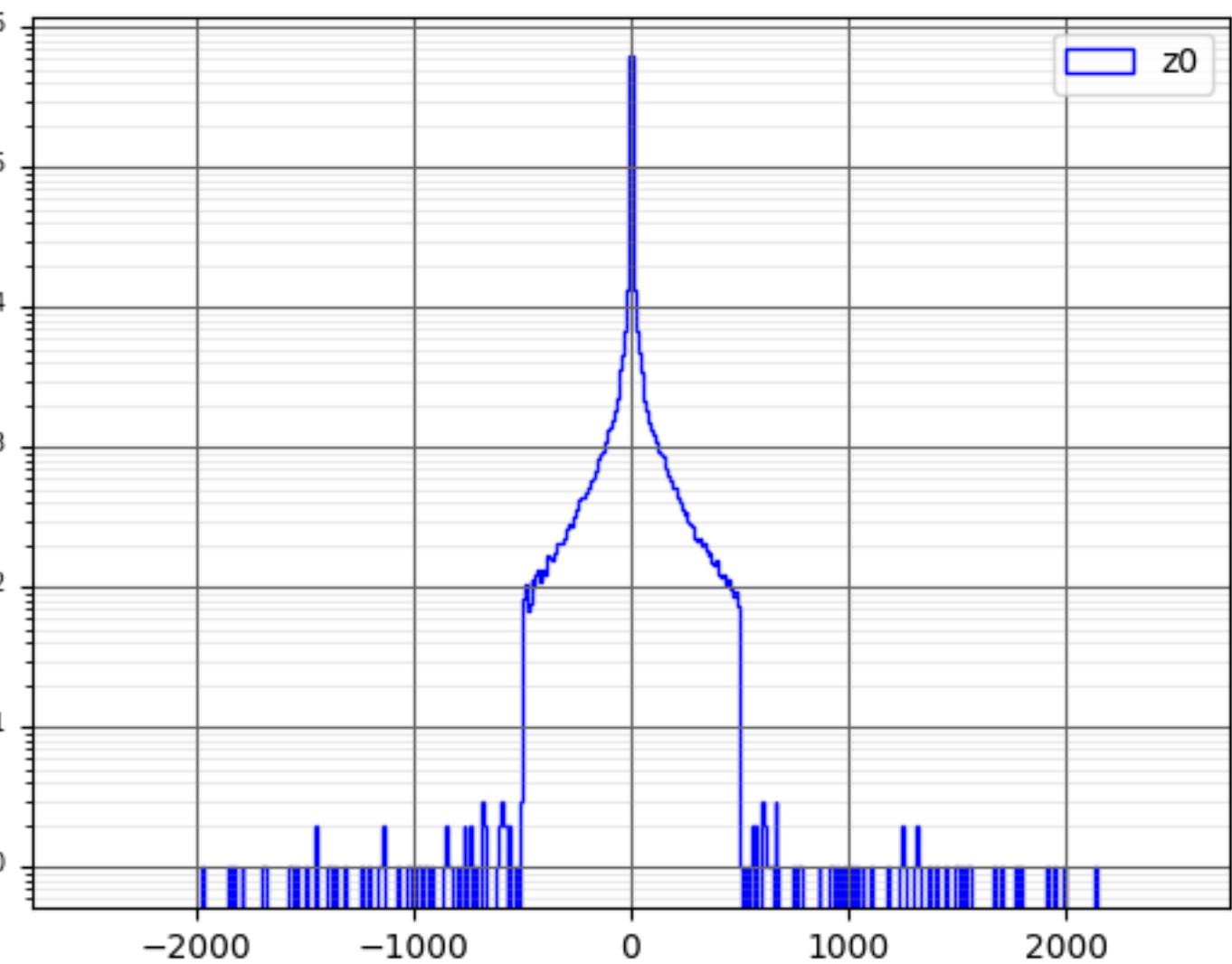


Energy

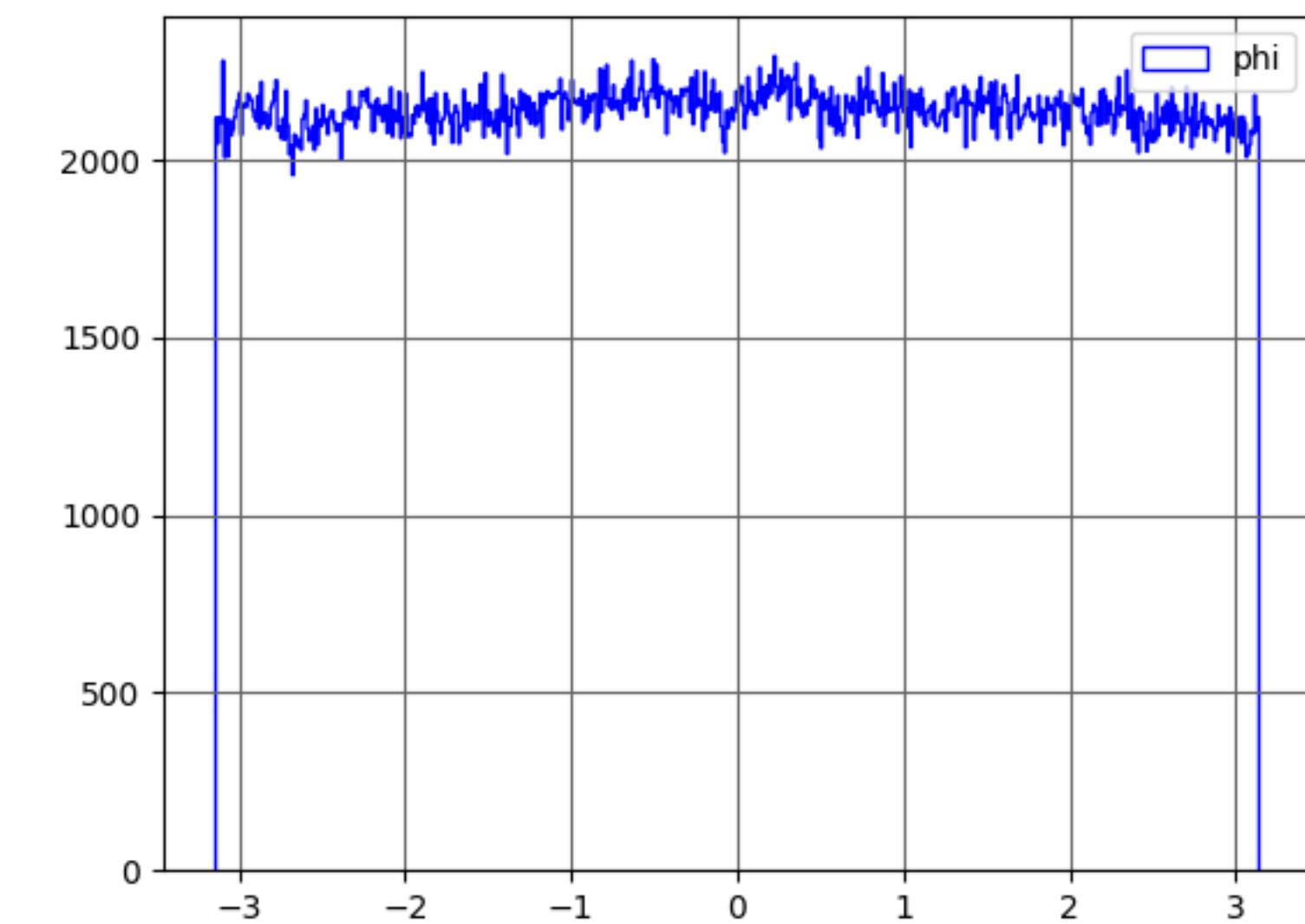
終狀態 $c\bar{c}$



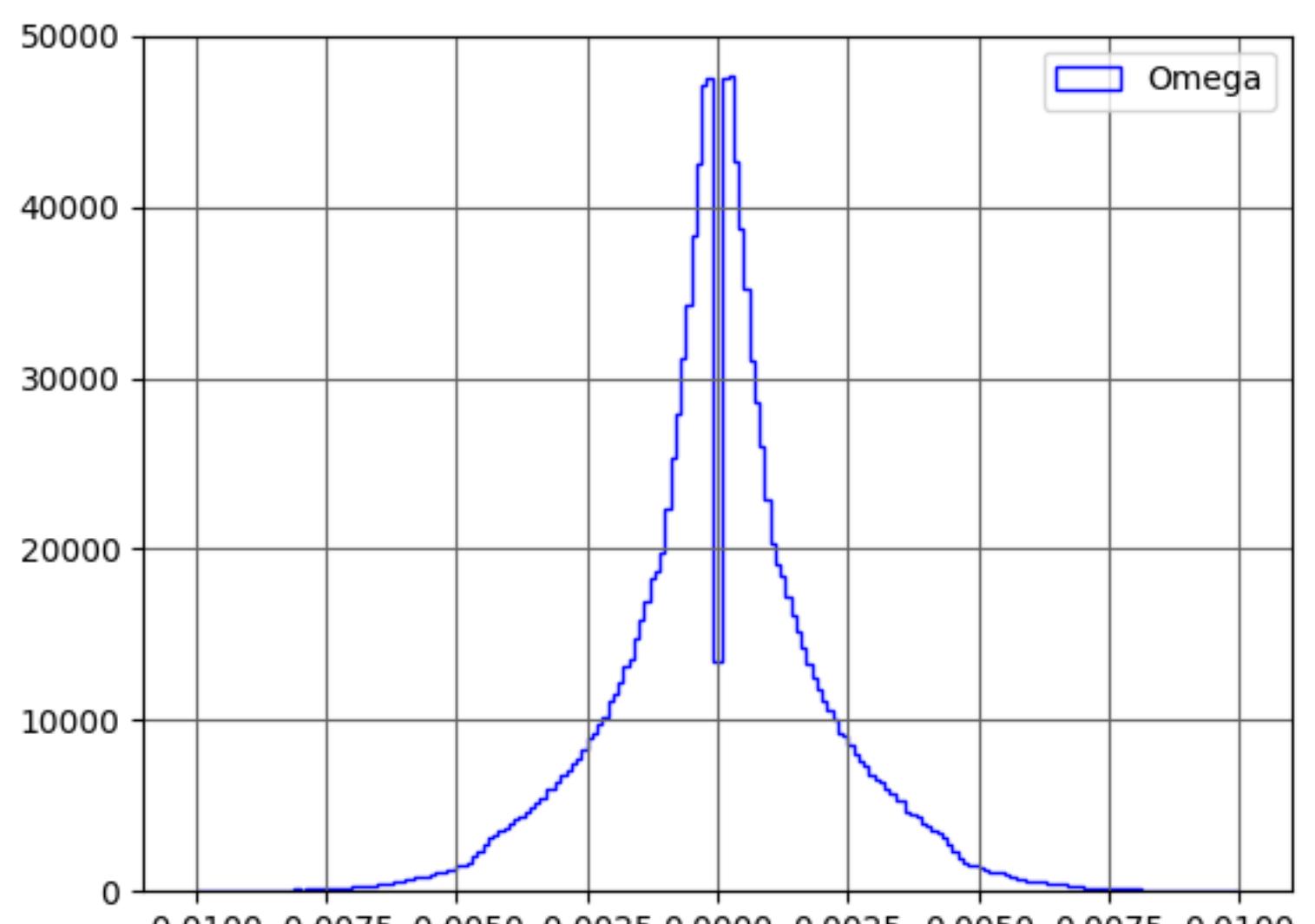
d_0



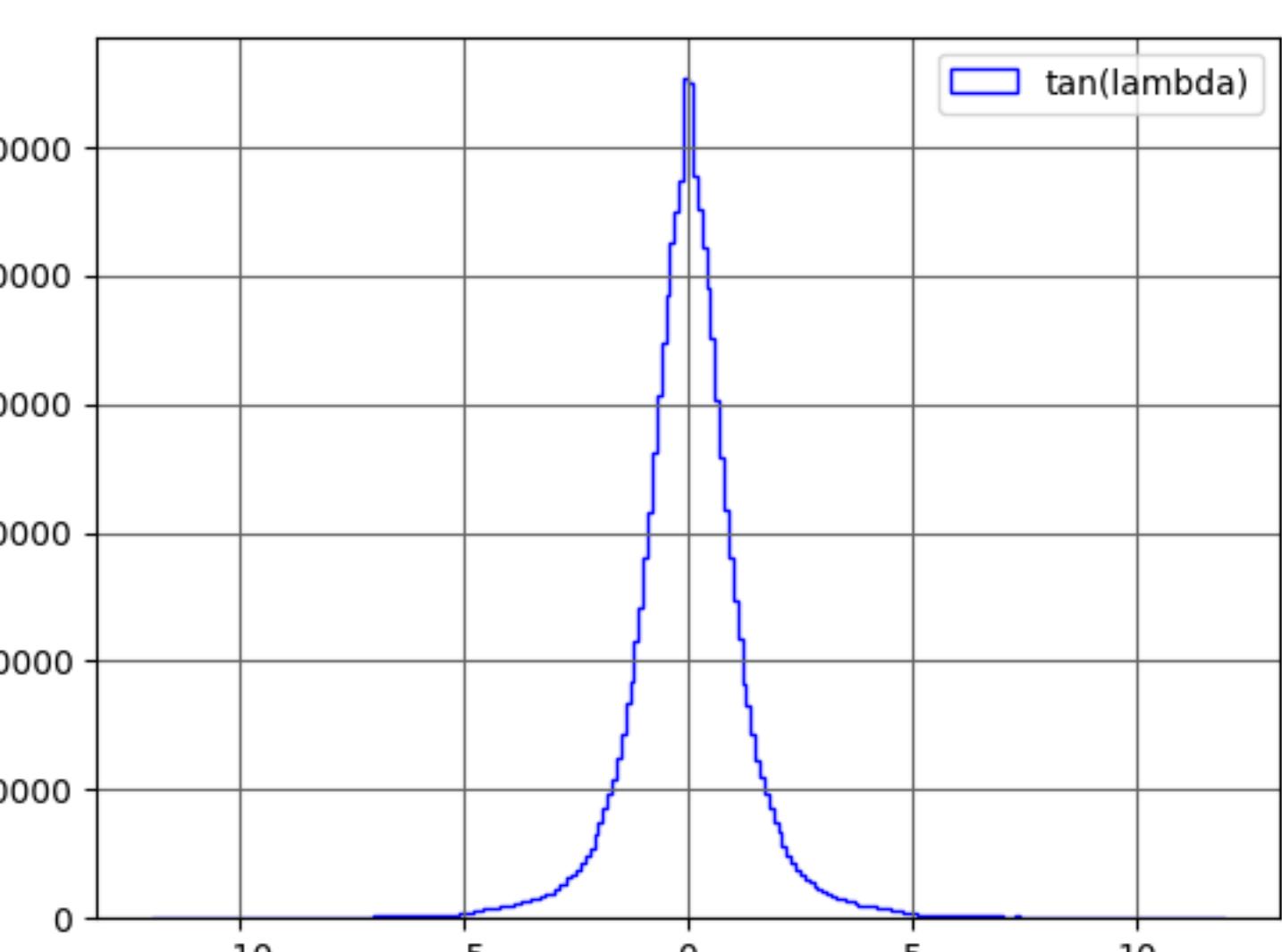
z_0



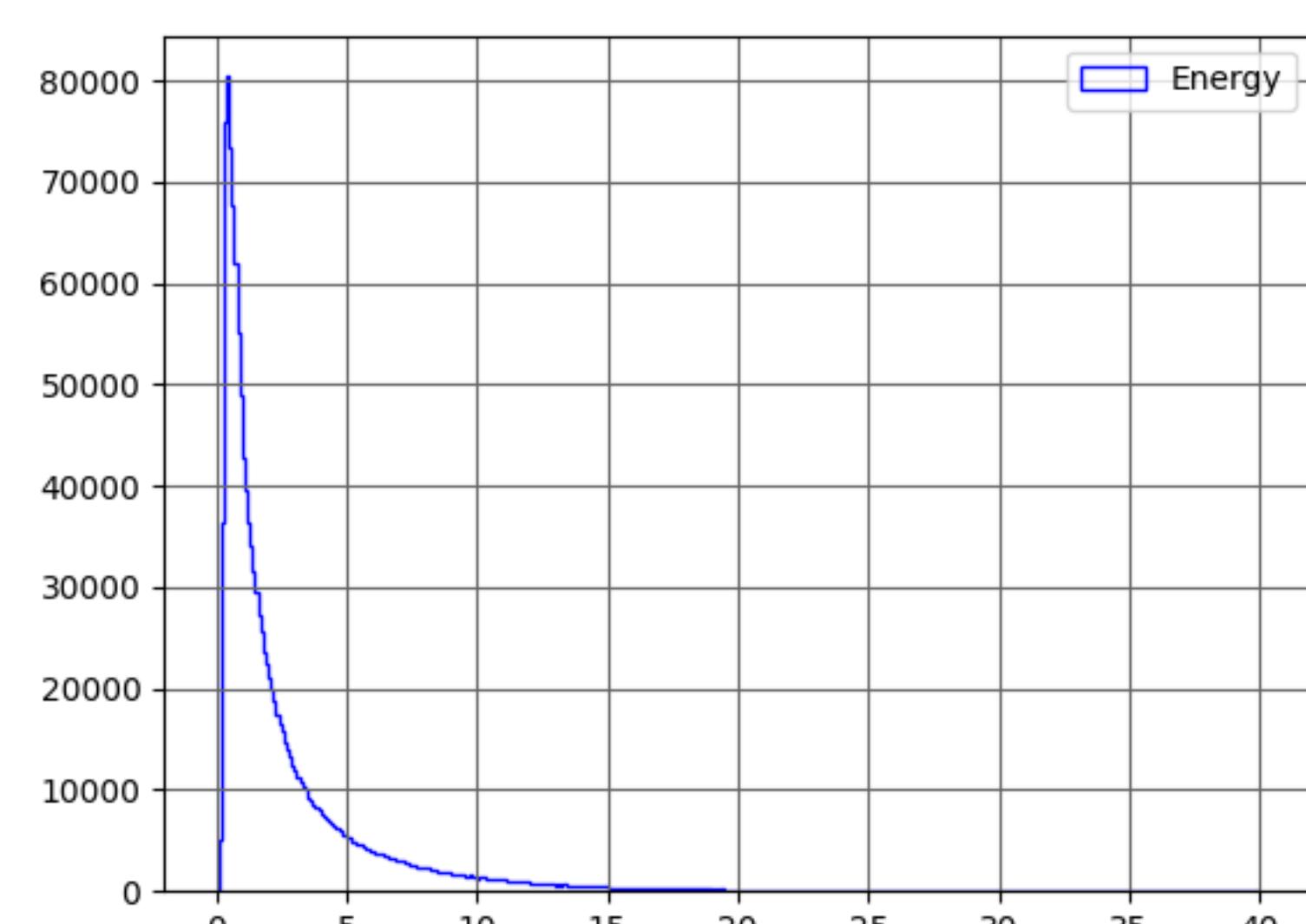
ϕ



Ω

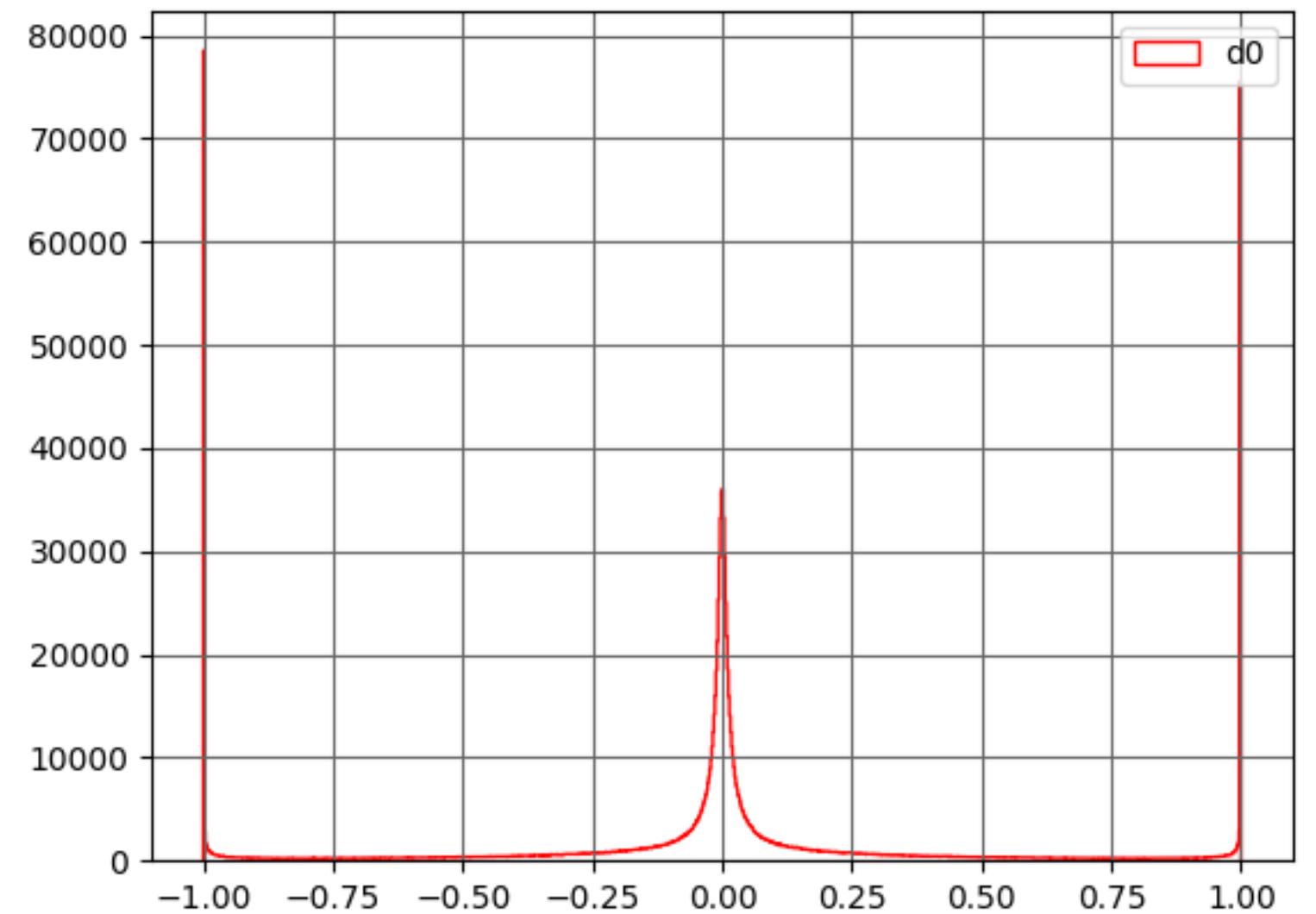


$\tan(\lambda)$

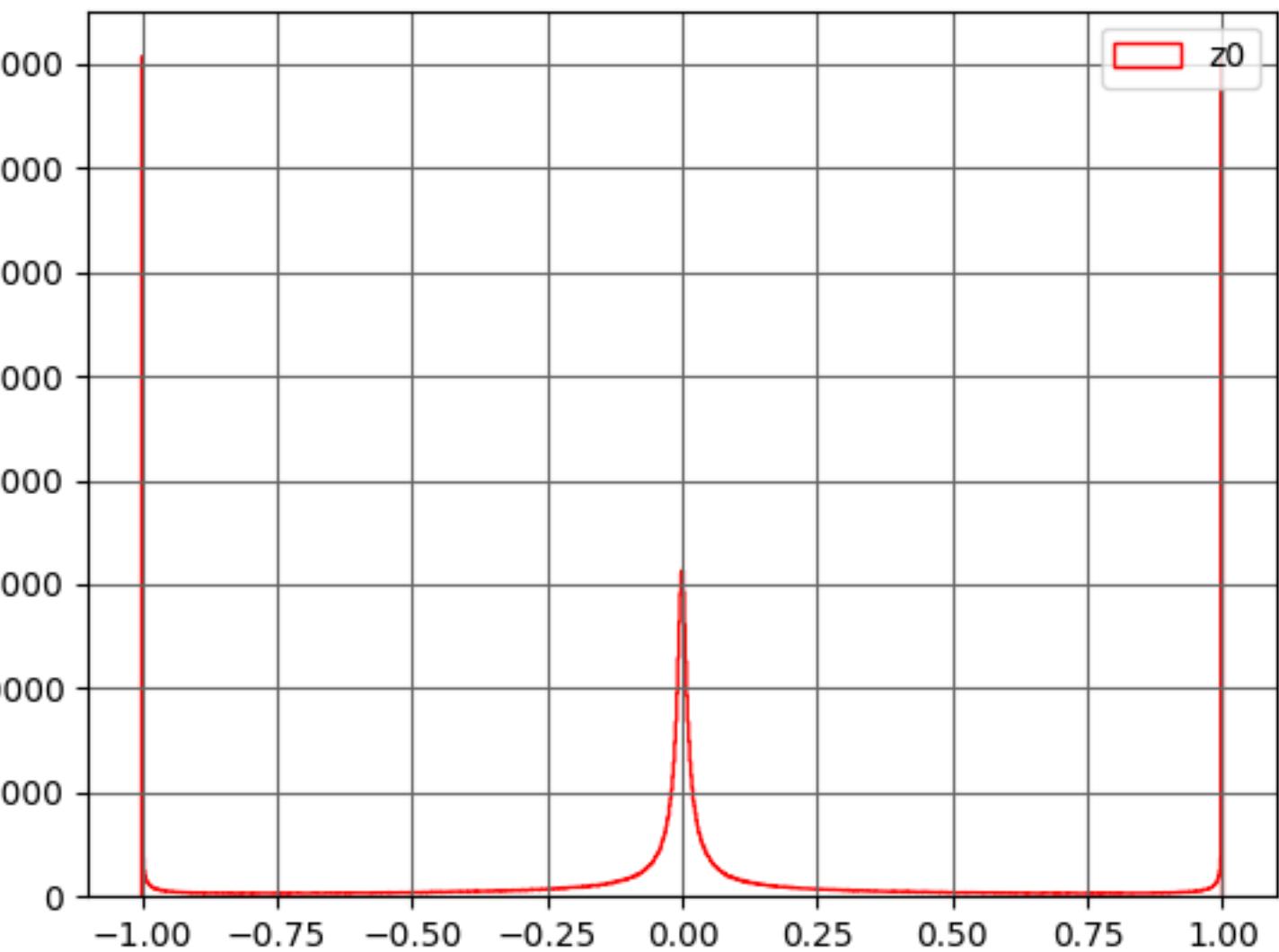


Energy

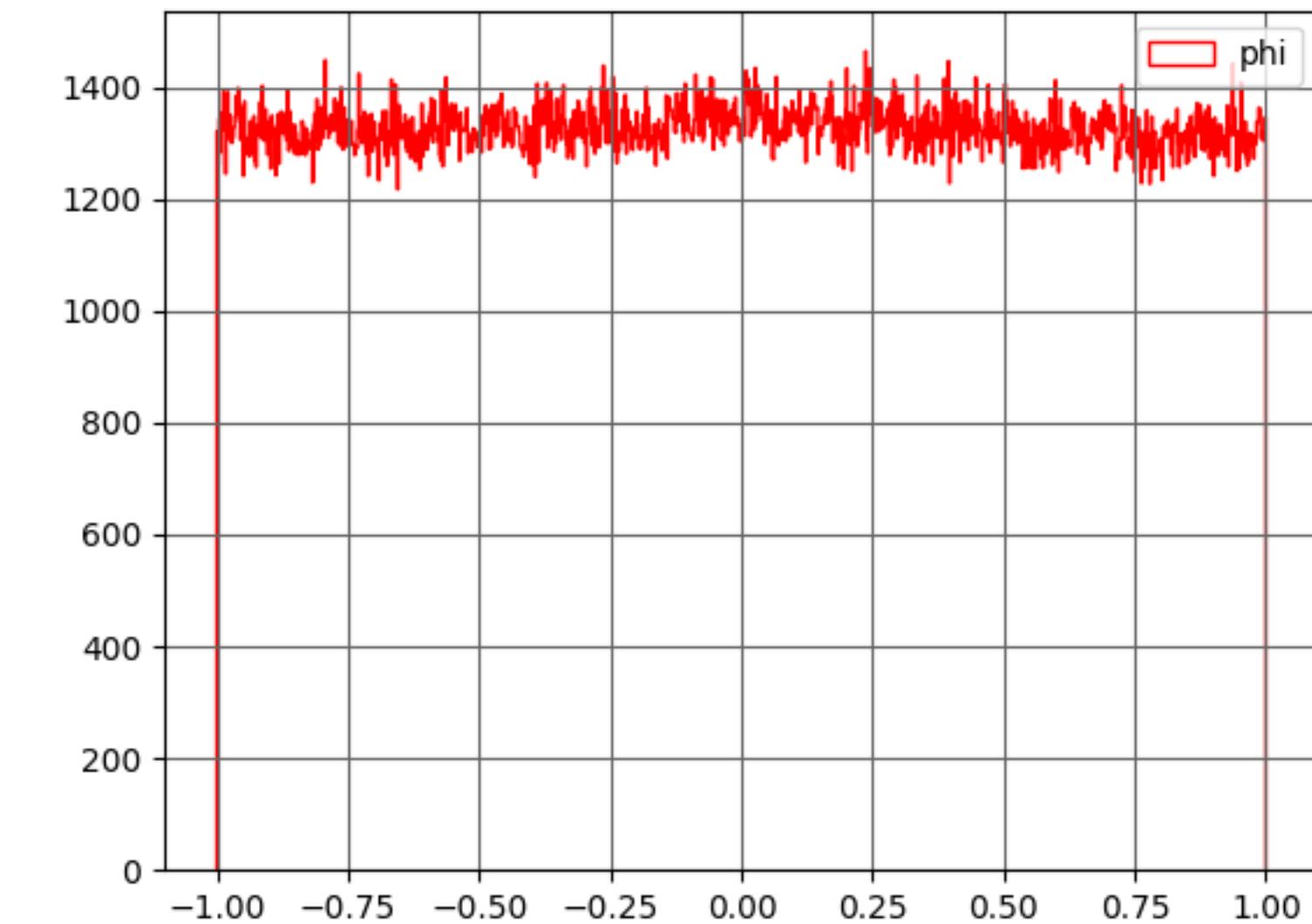
終狀態 $b\bar{b}$



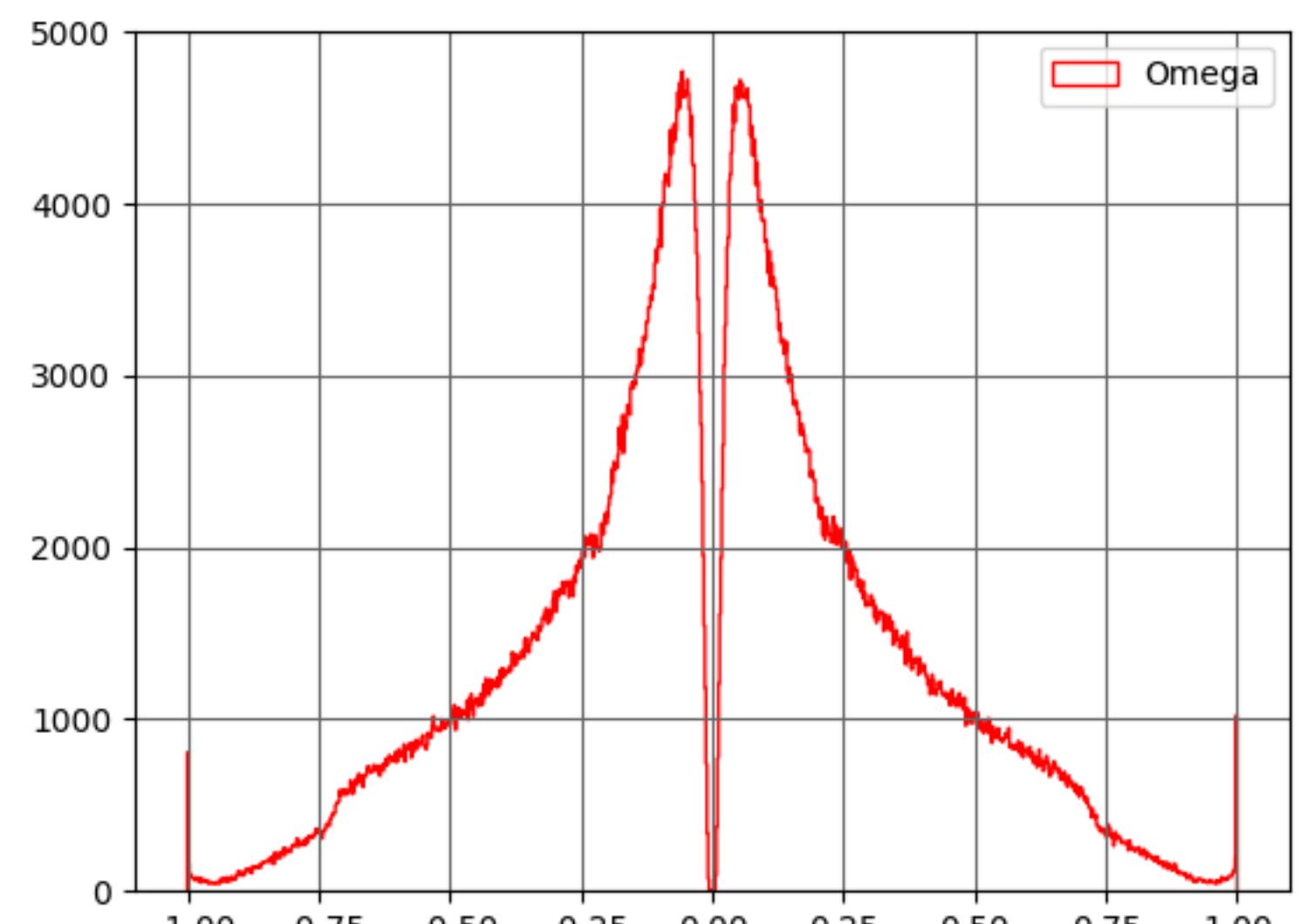
d_0



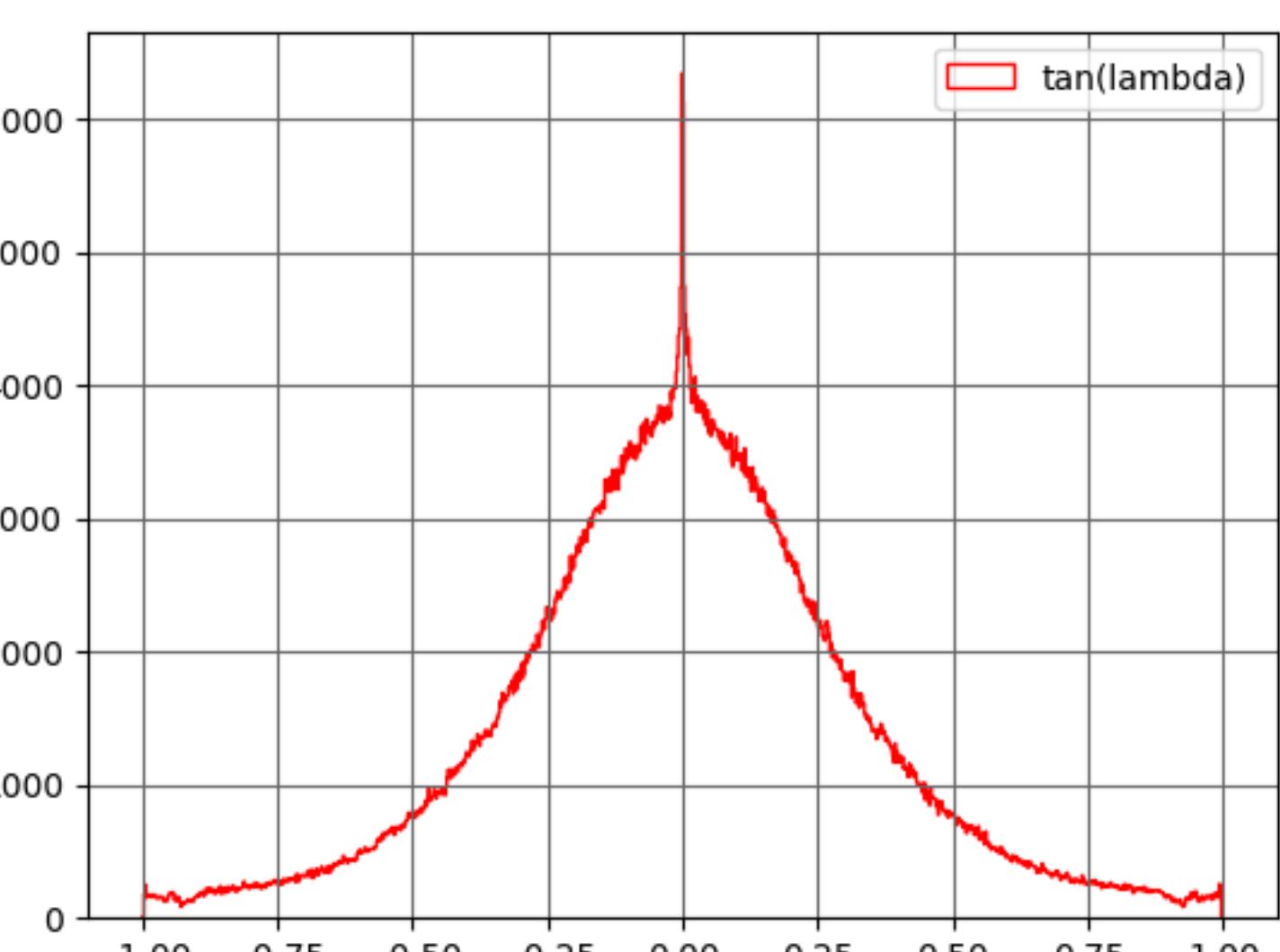
z_0



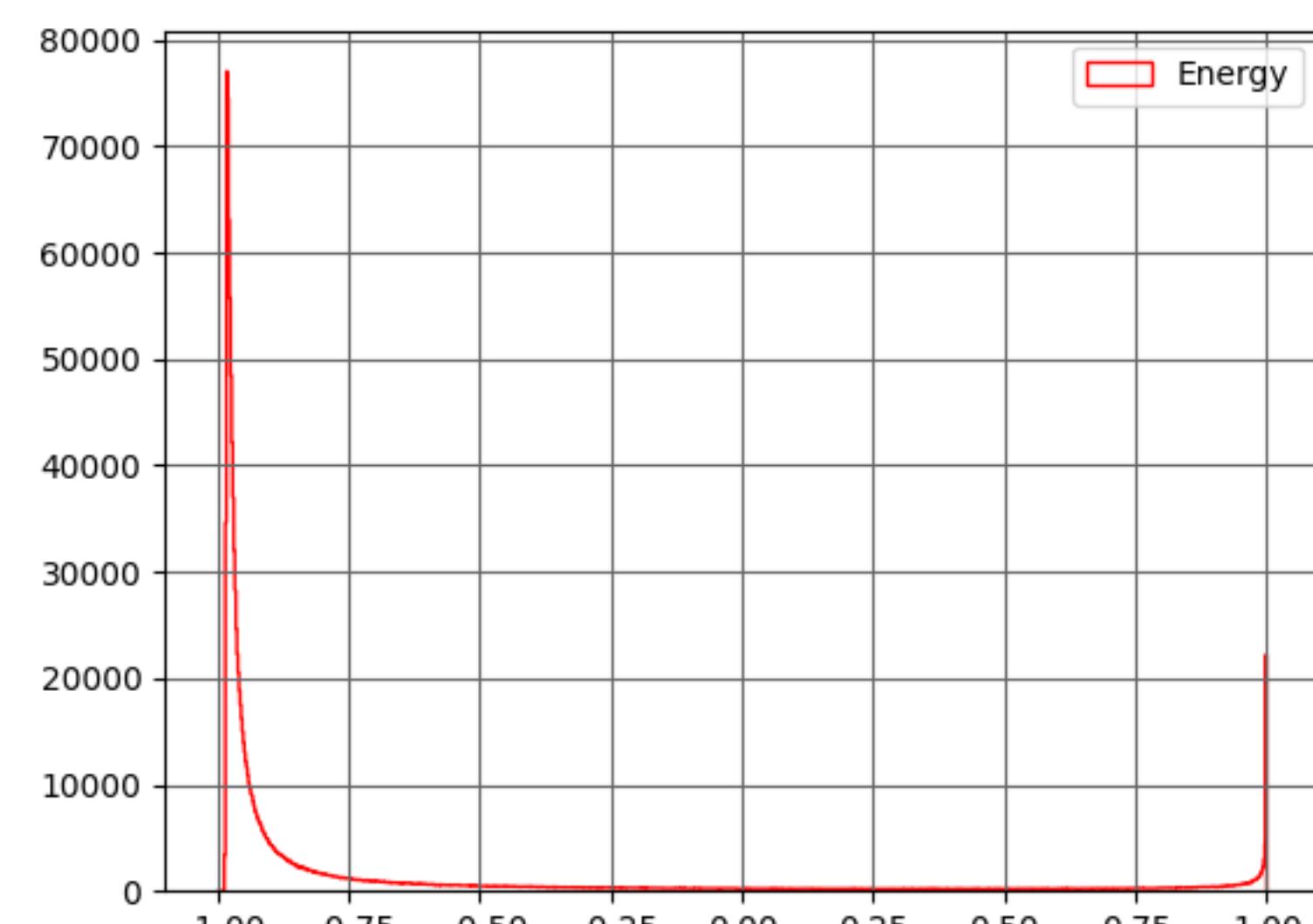
ϕ



Ω

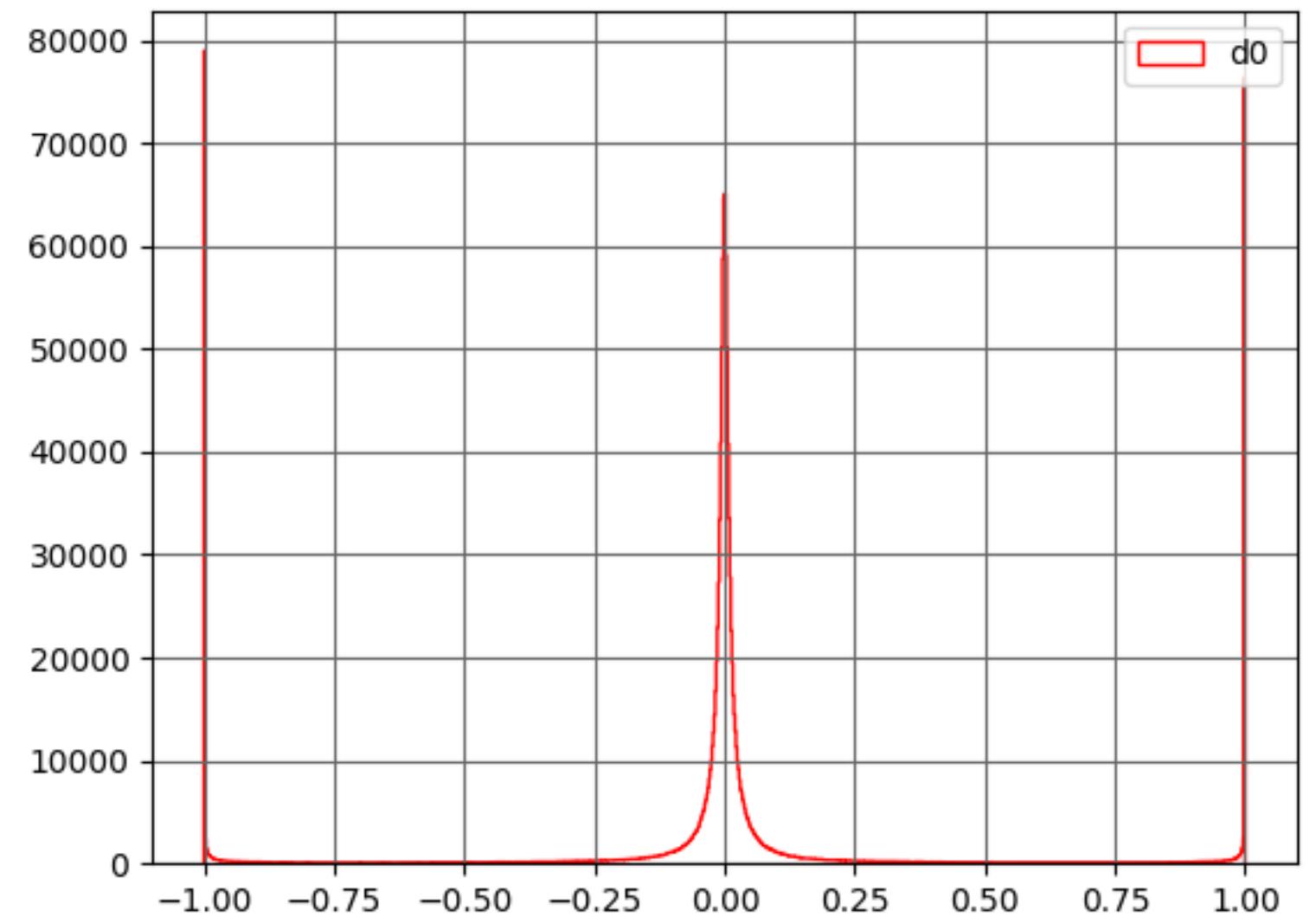


$\tan(\lambda)$

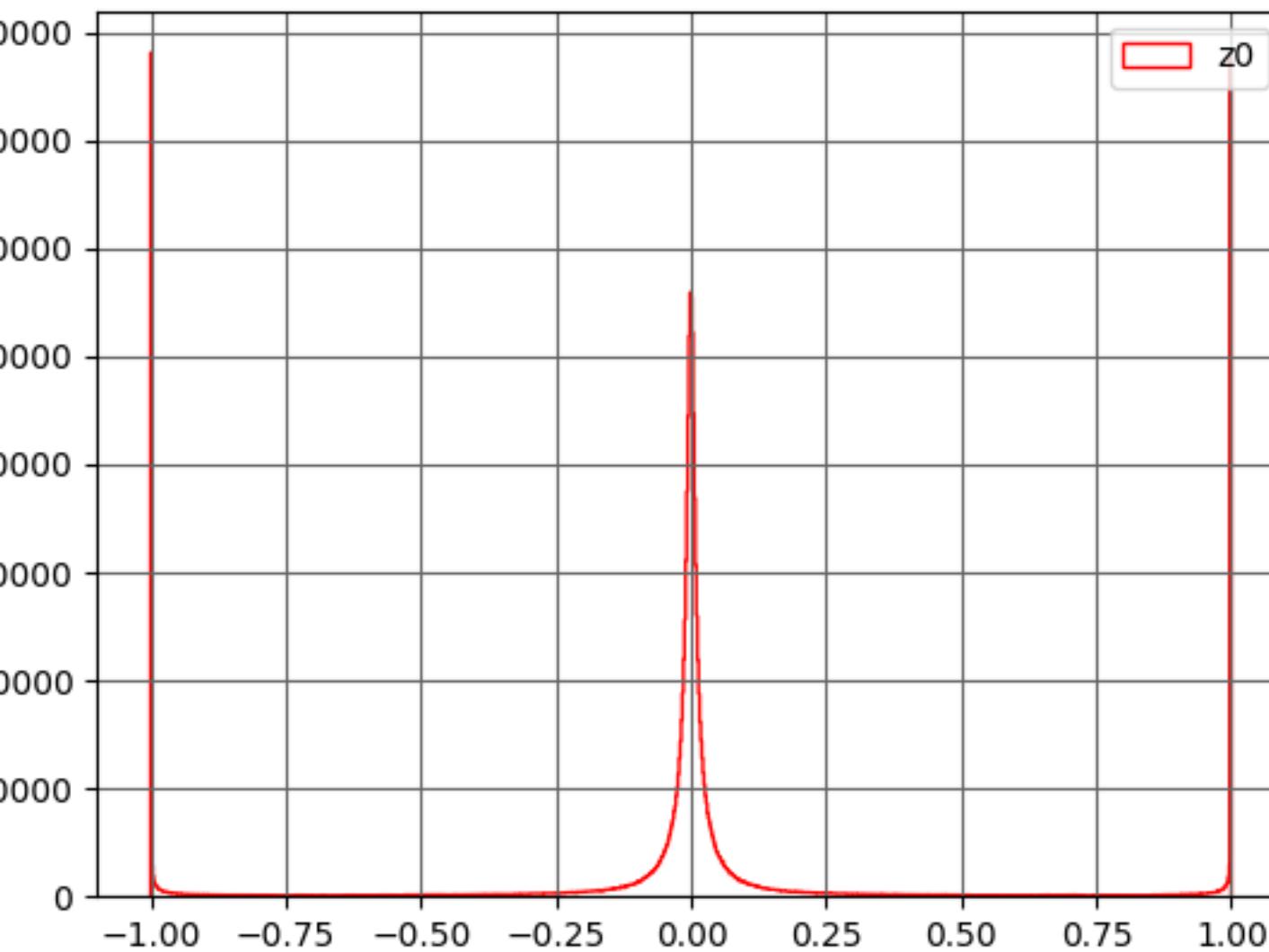


Energy

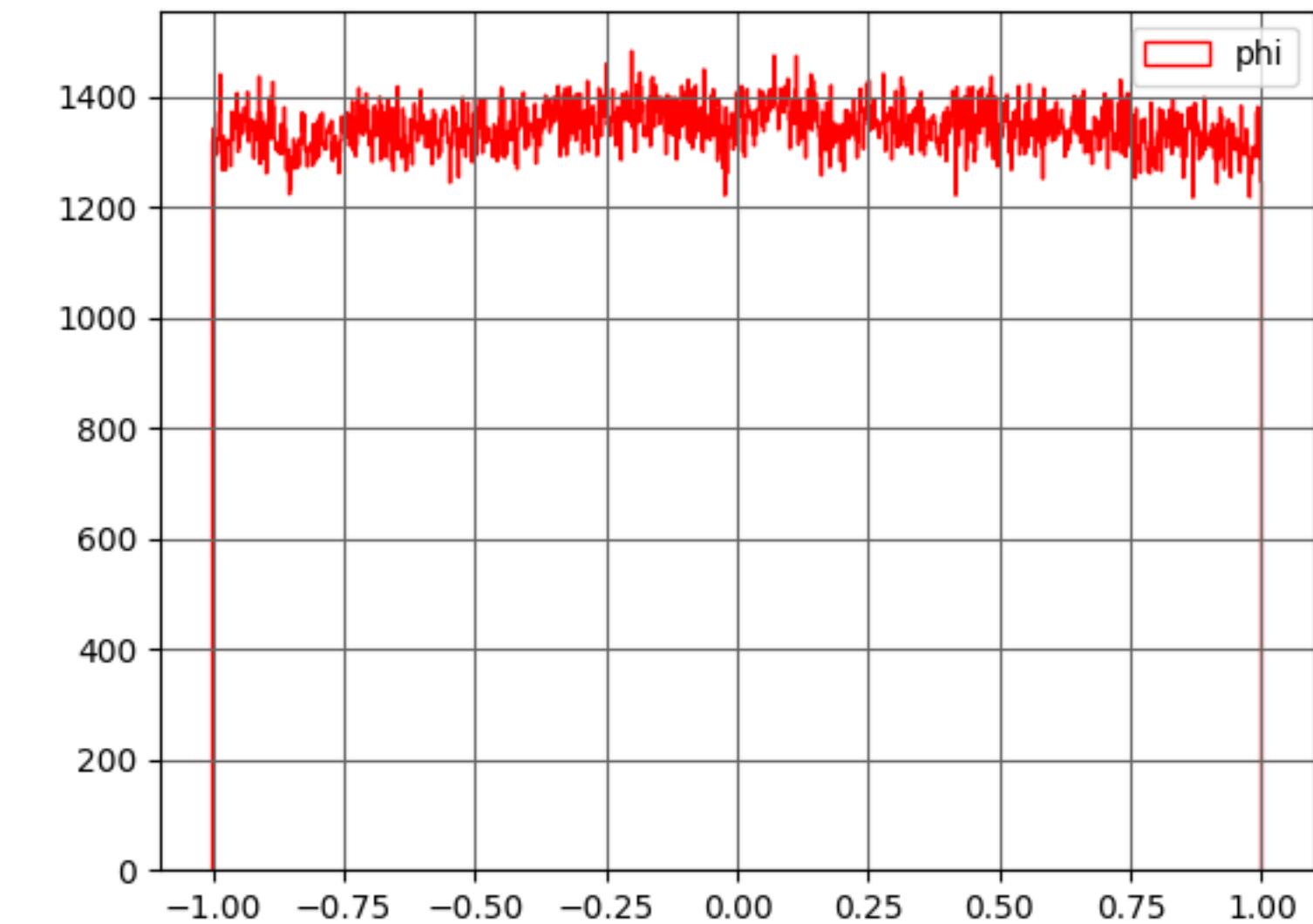
終狀態 $c\bar{c}$



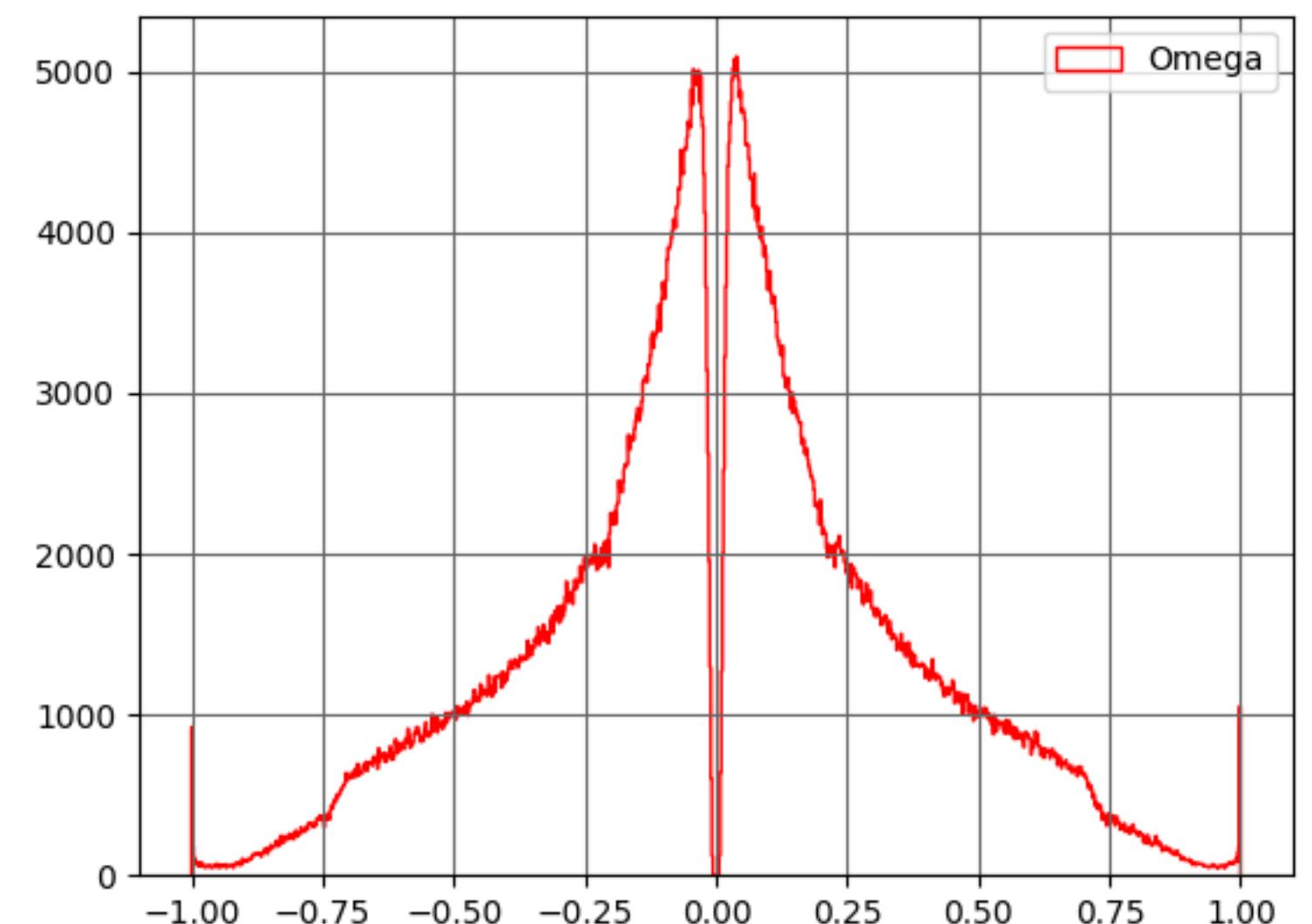
d_0



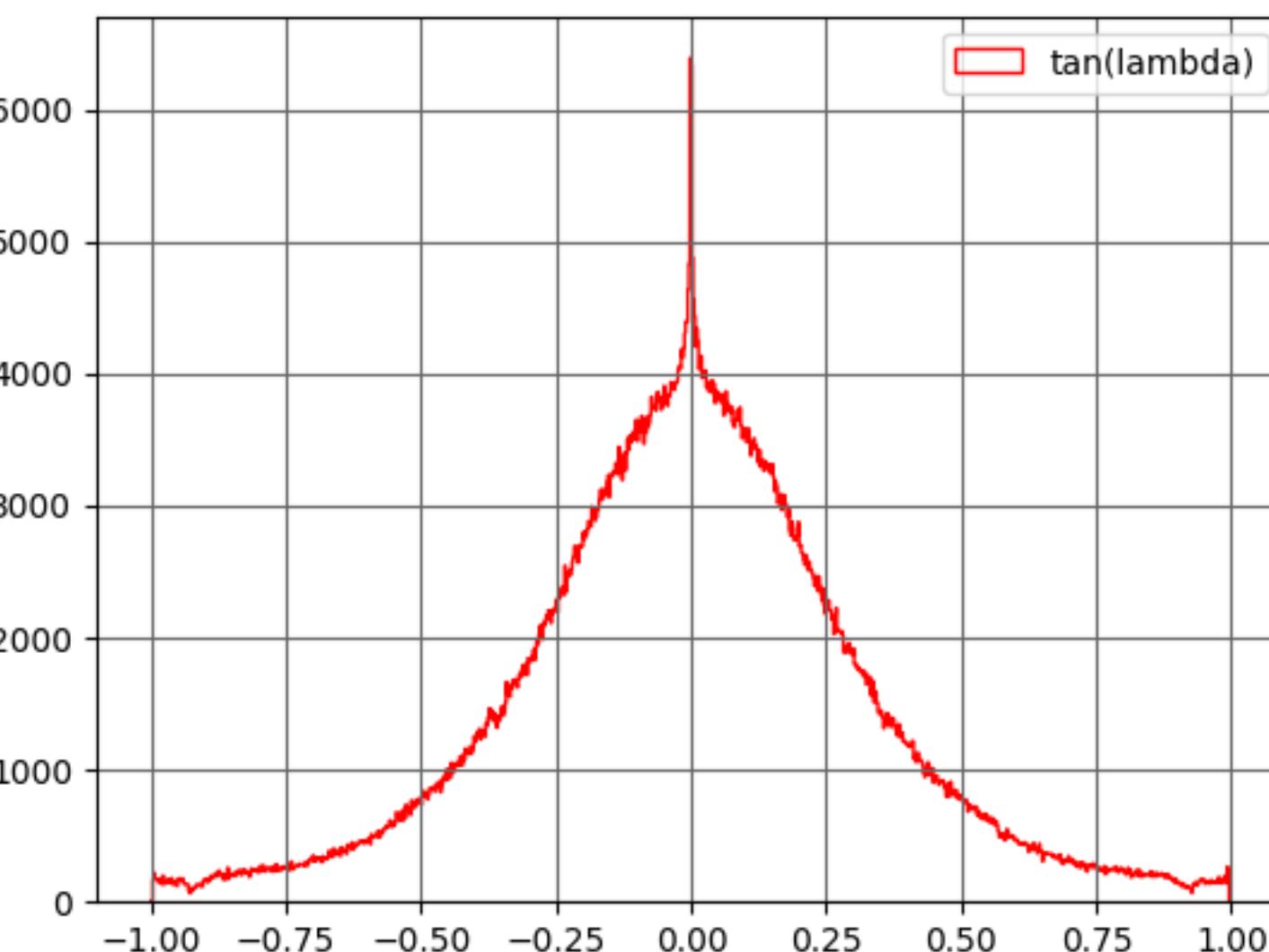
z_0



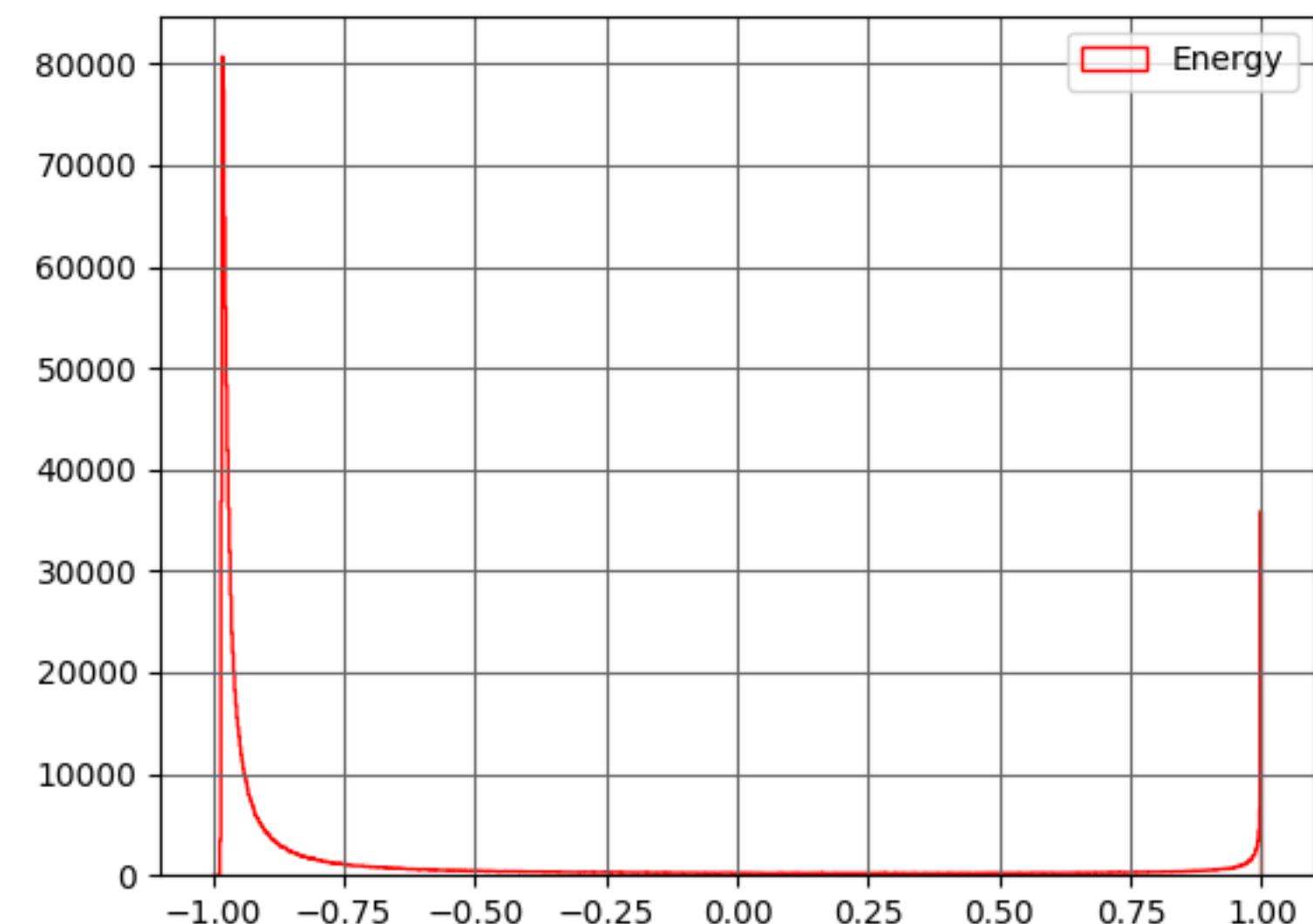
ϕ



Ω

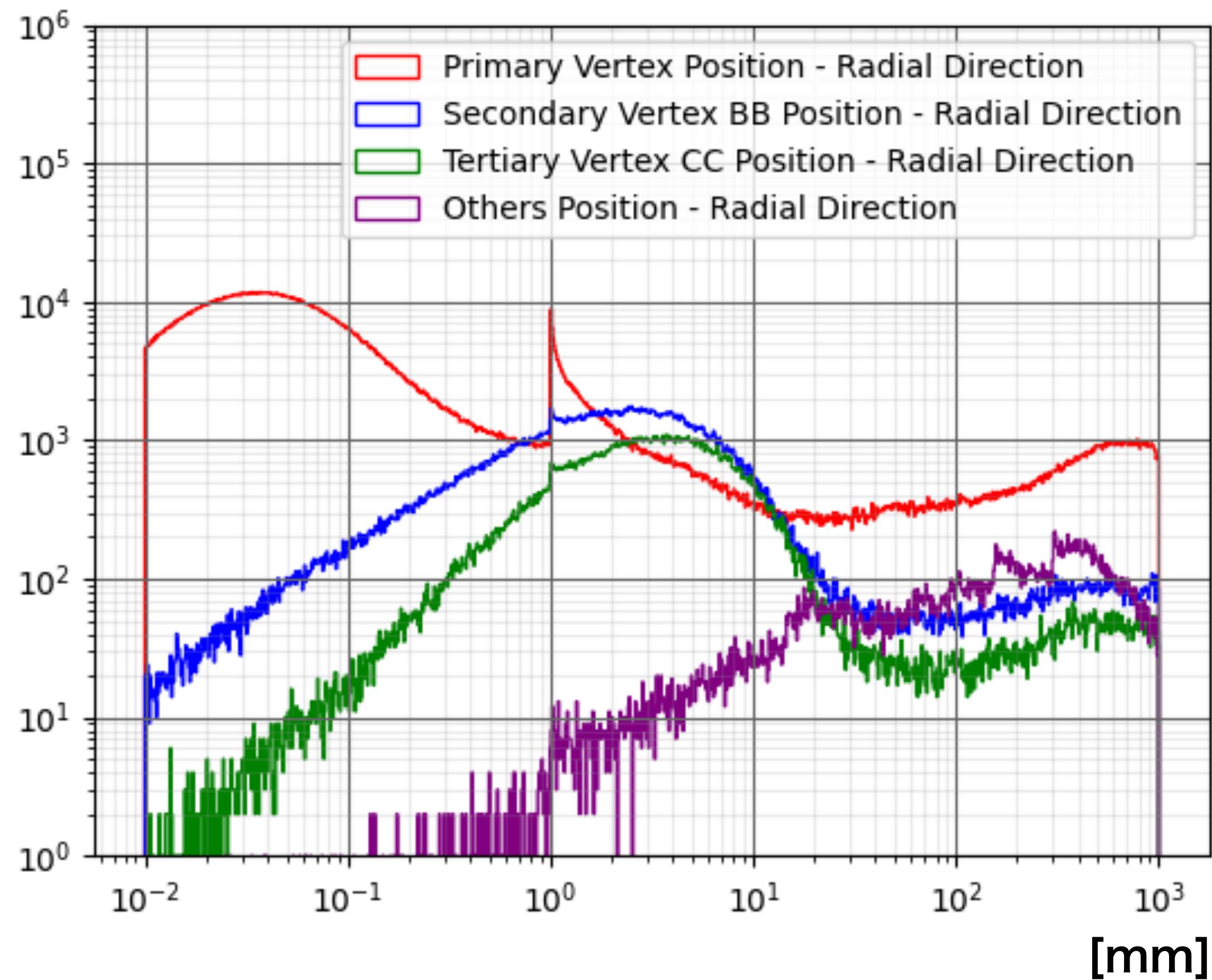


$\tan(\lambda)$

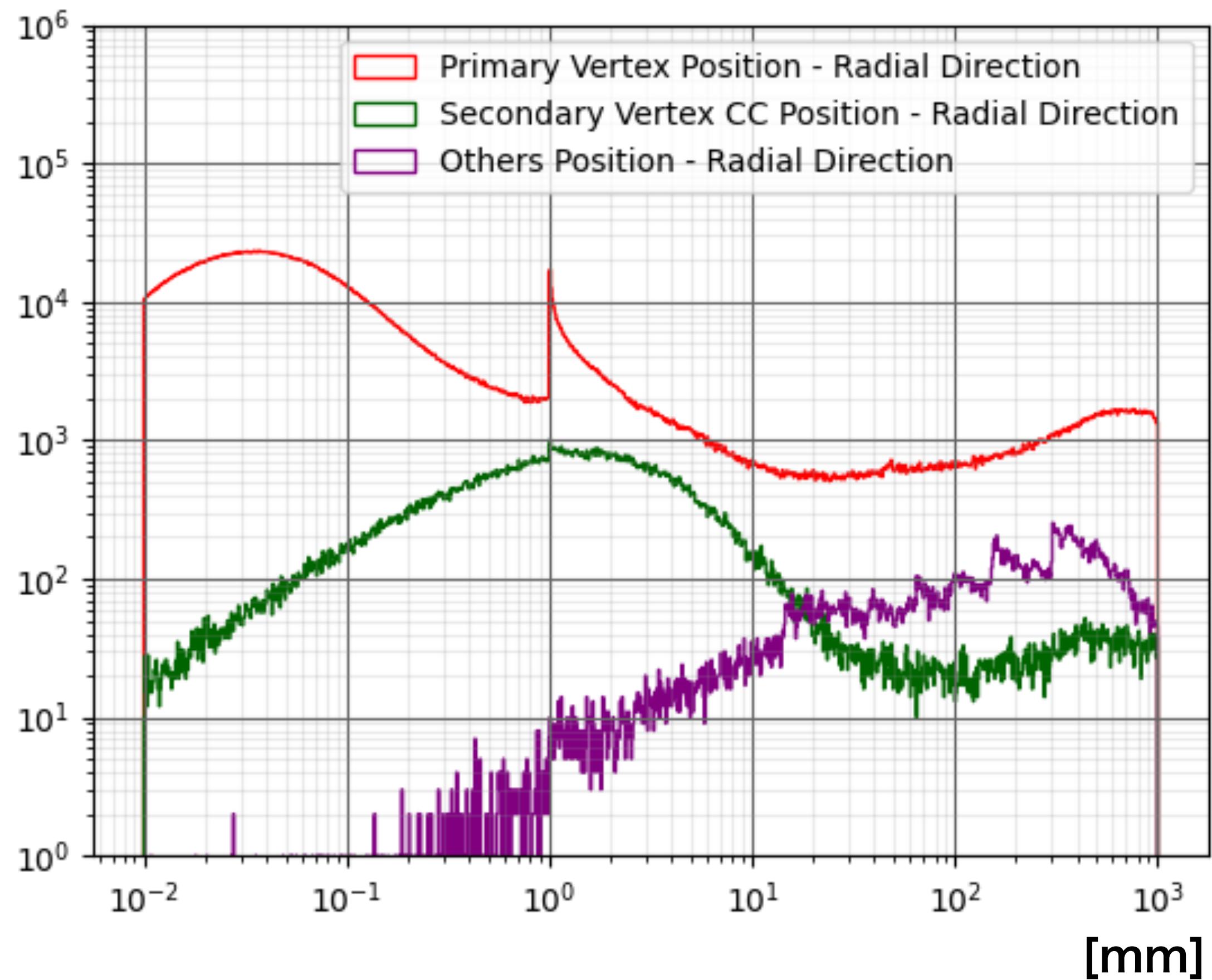


Energy

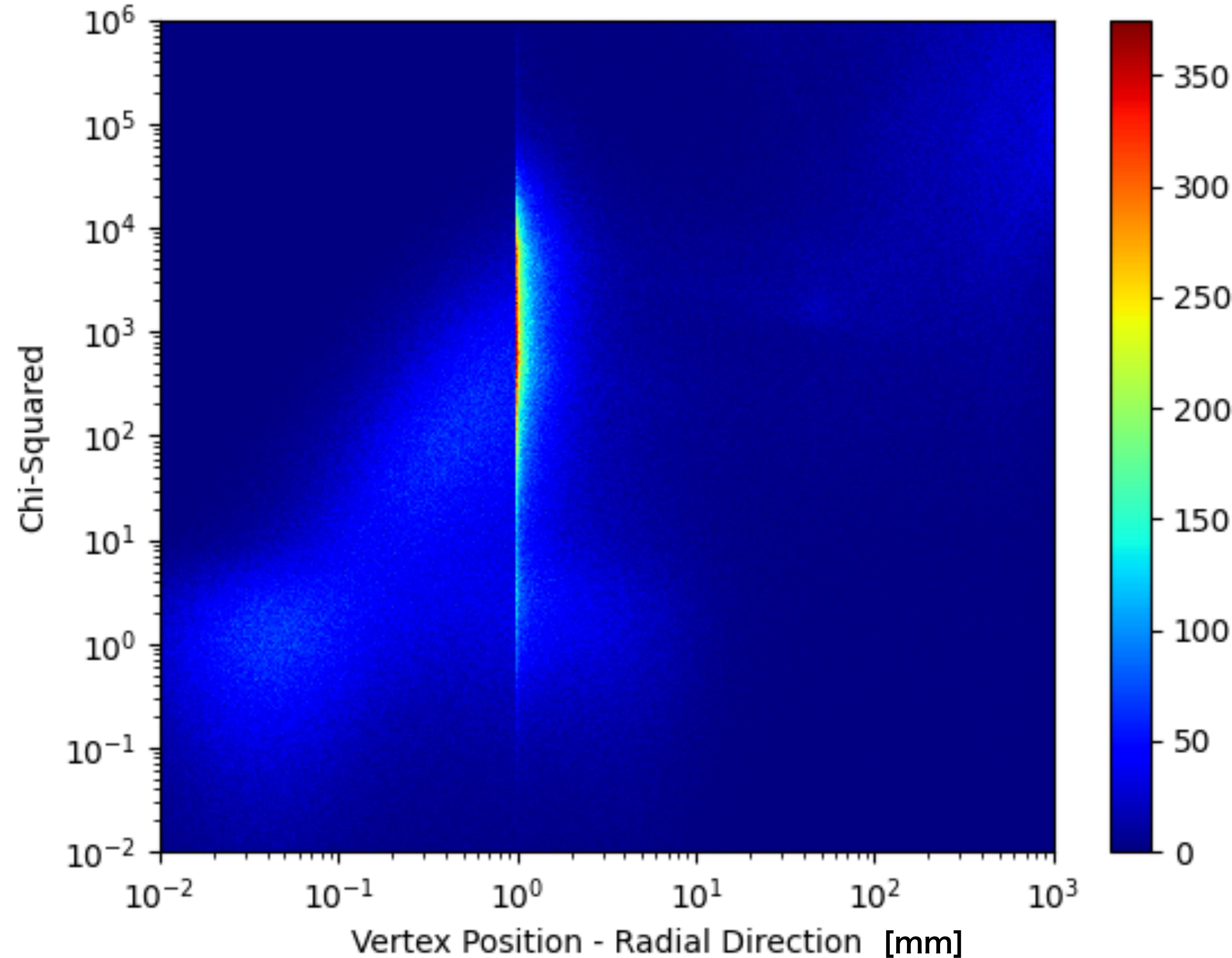
終状態 $b\bar{b}$



終状態 $c\bar{c}$



終状態 $b\bar{b}$



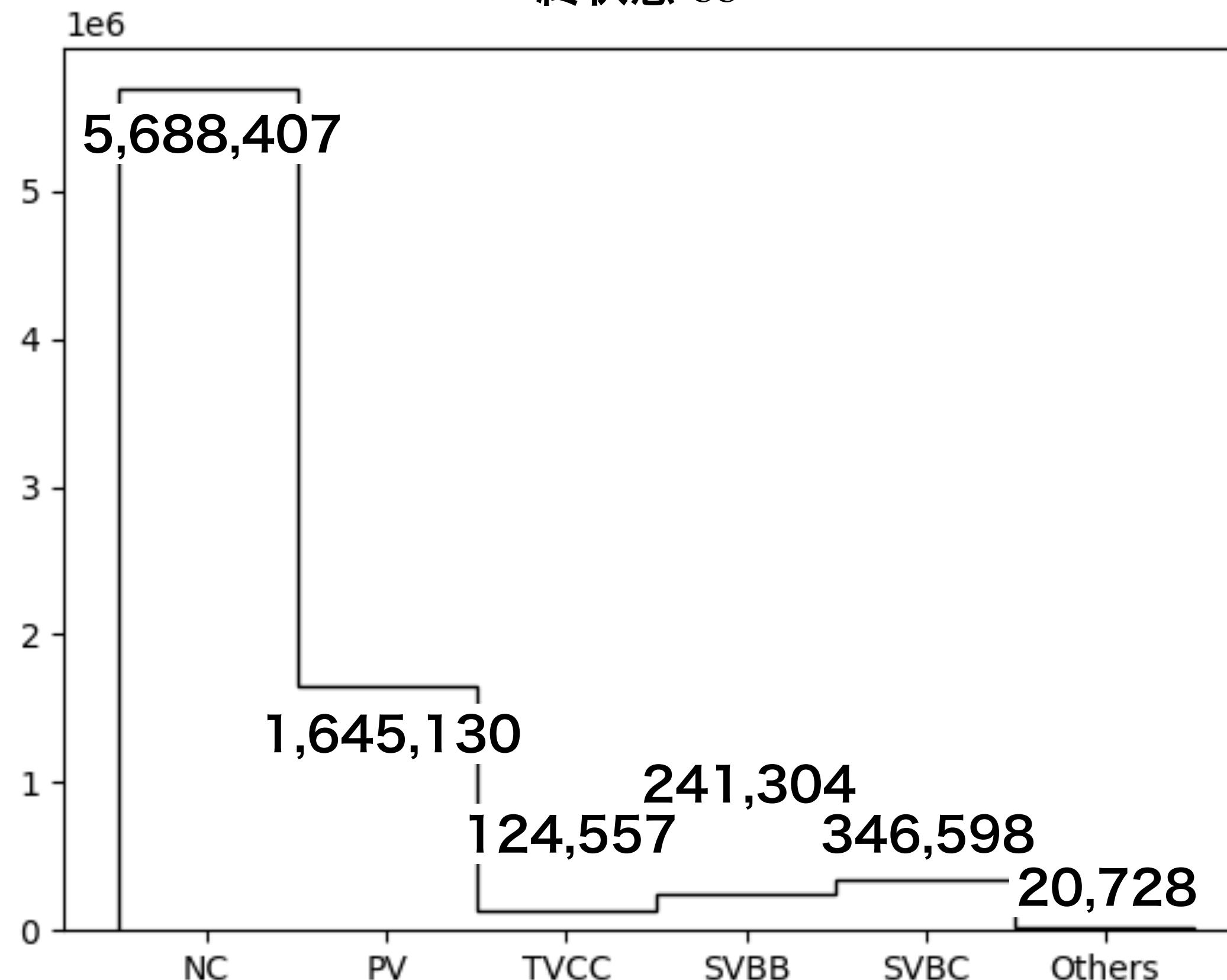
Secondary Vertex BC
(SVBC)

IP
Primary Vertex

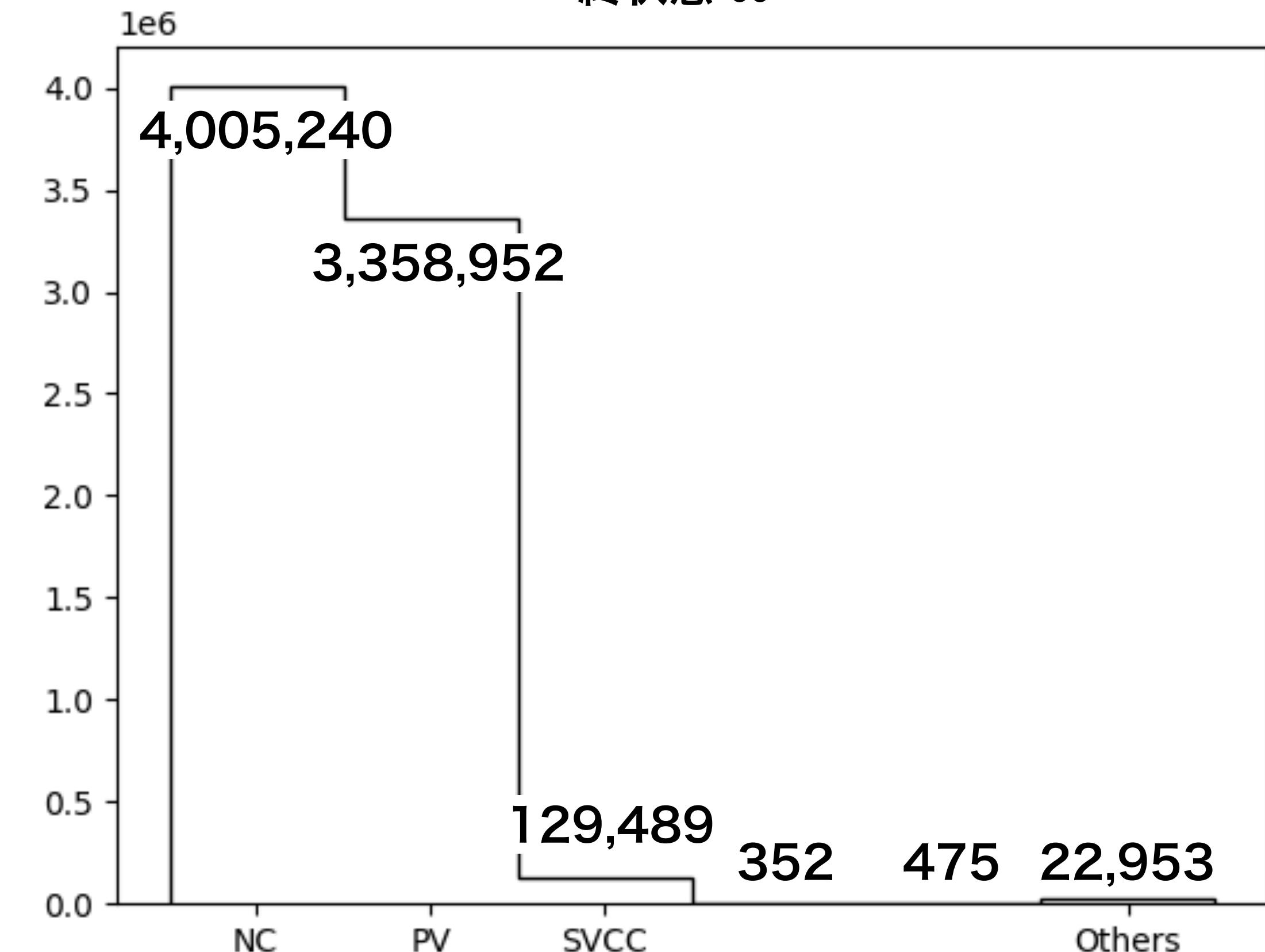
ボトム・フレーバーのハドロンによる
Secondary Vertex (SVBB)

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

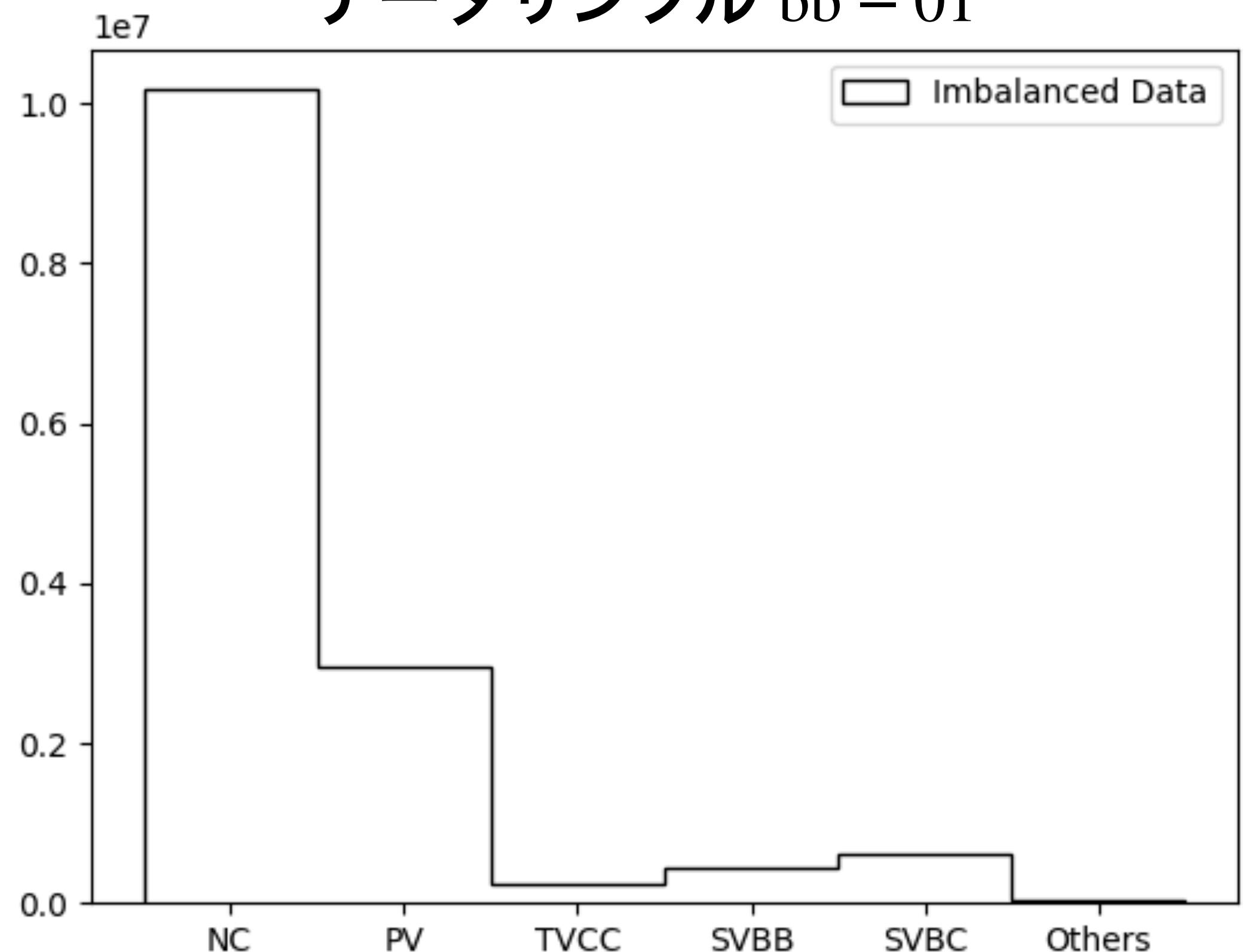
終状態 $b\bar{b}$



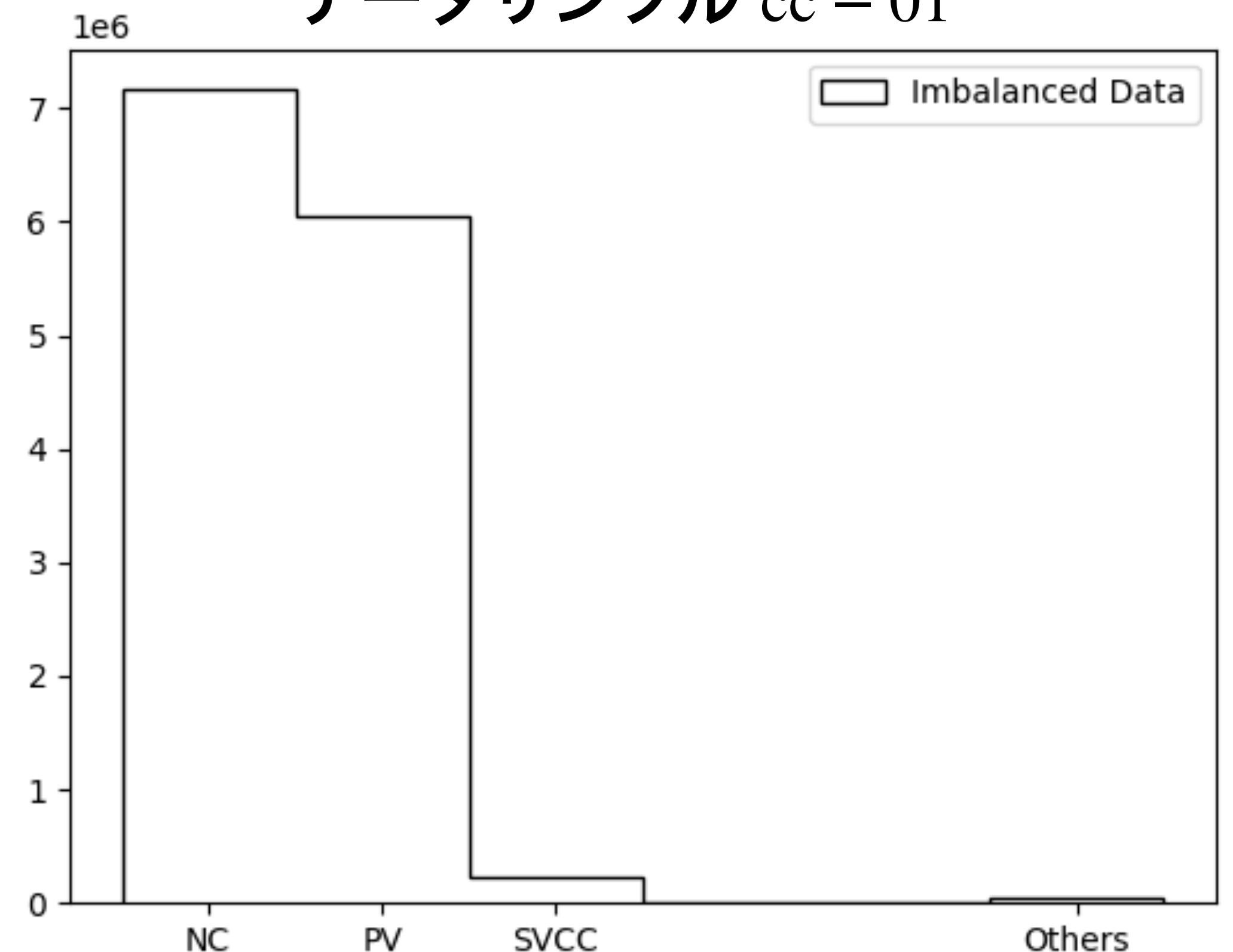
終状態 $c\bar{c}$



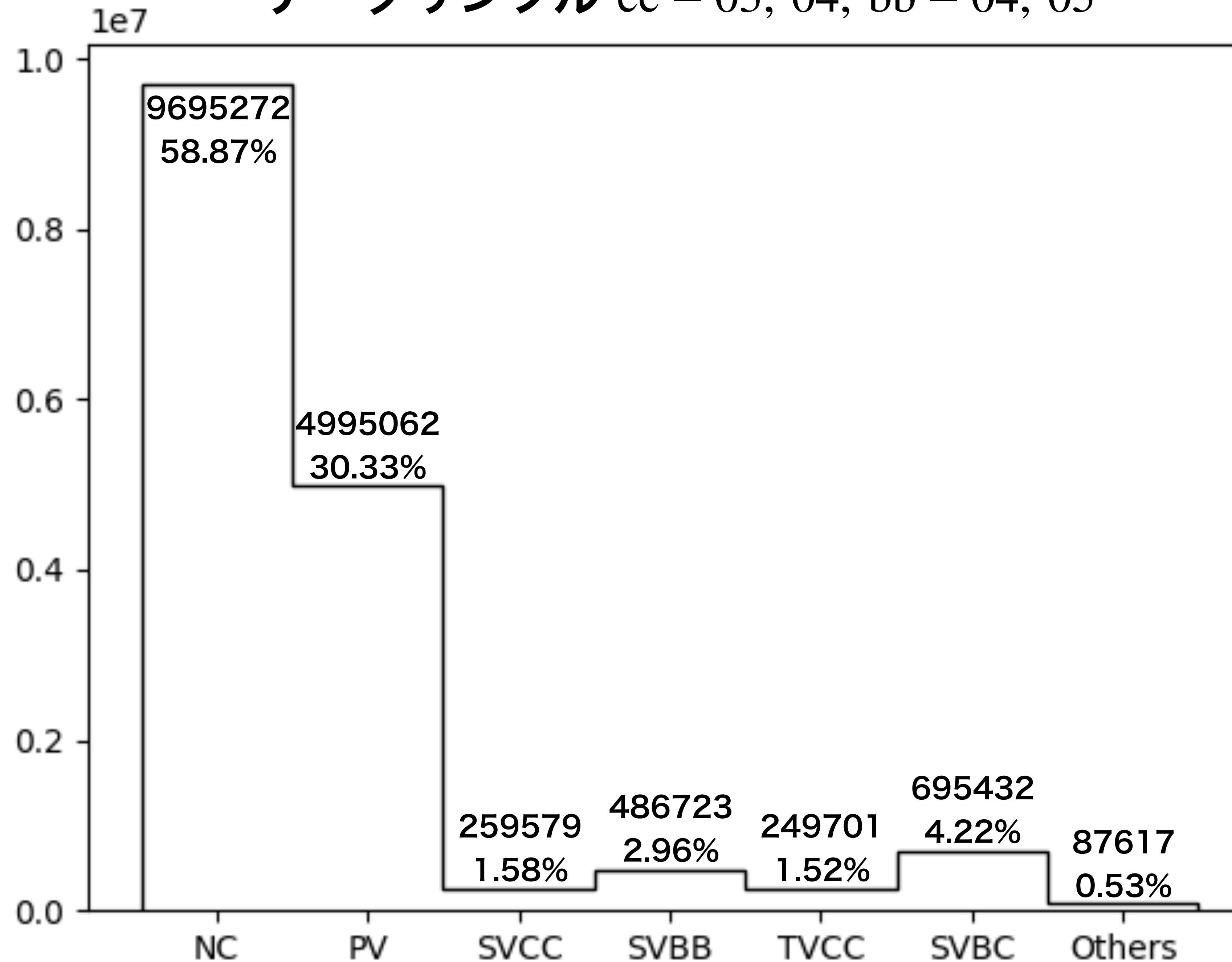
データサンプル $b\bar{b}$ – 01

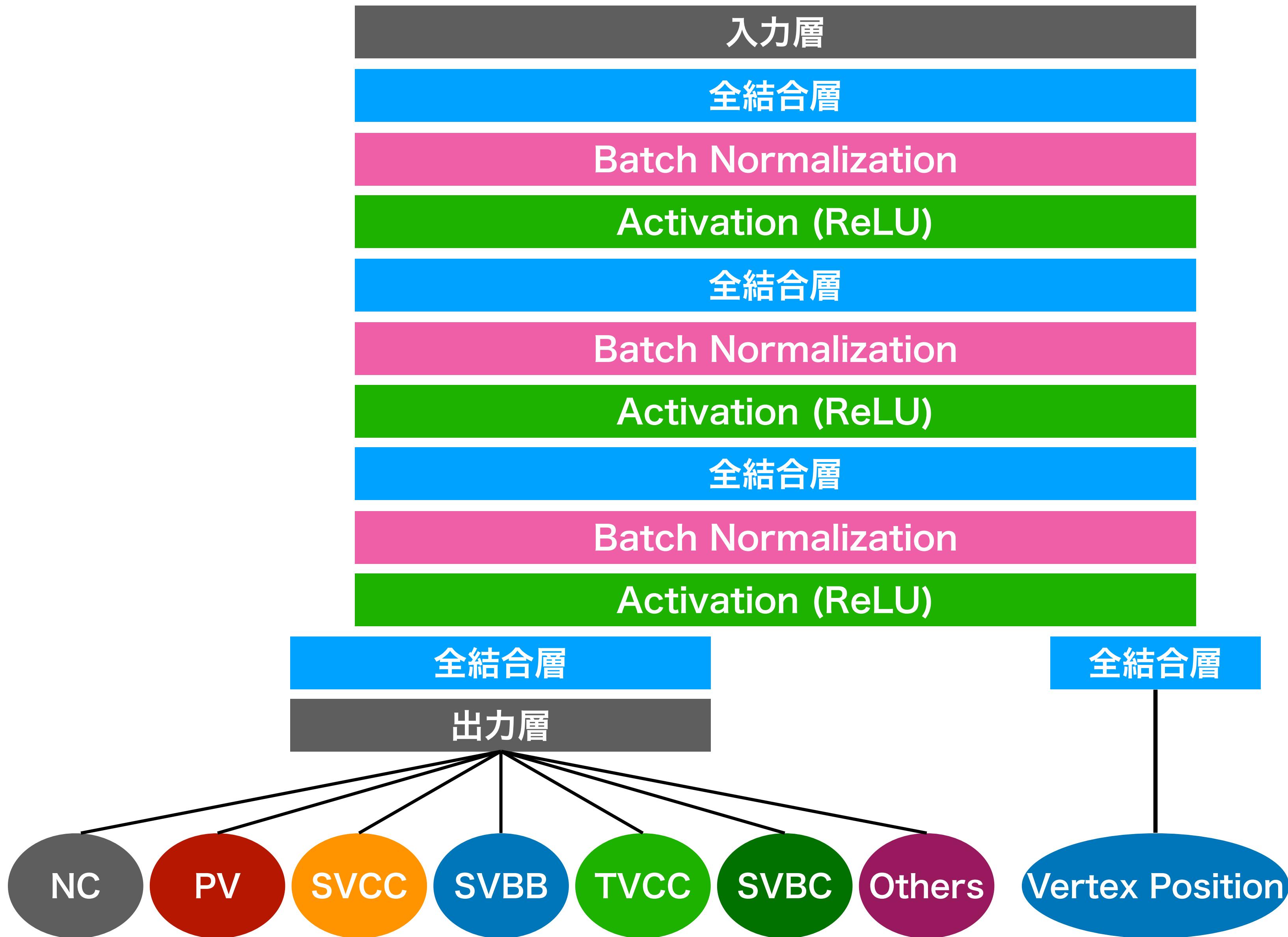


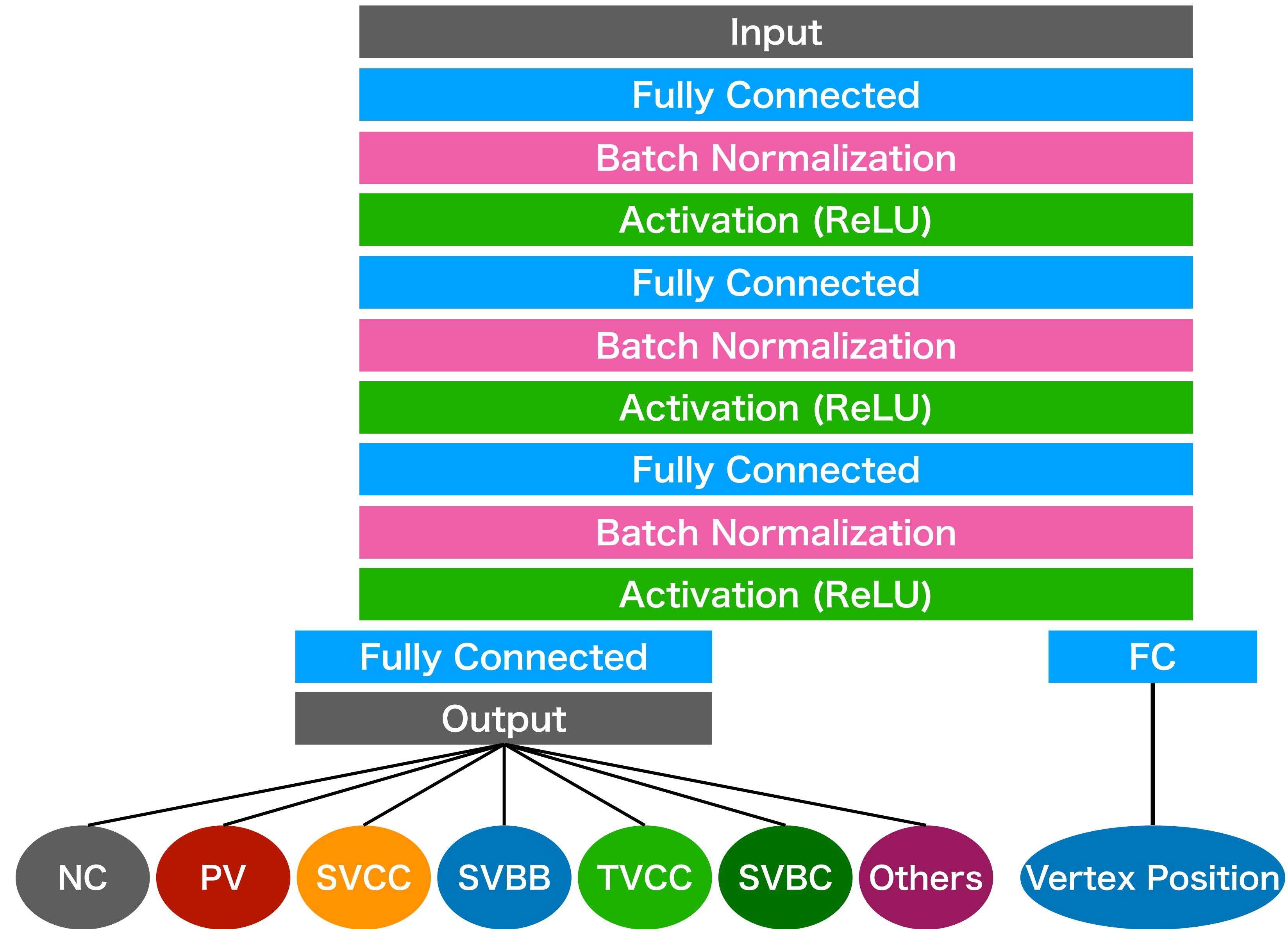
データサンプル $c\bar{c}$ – 01

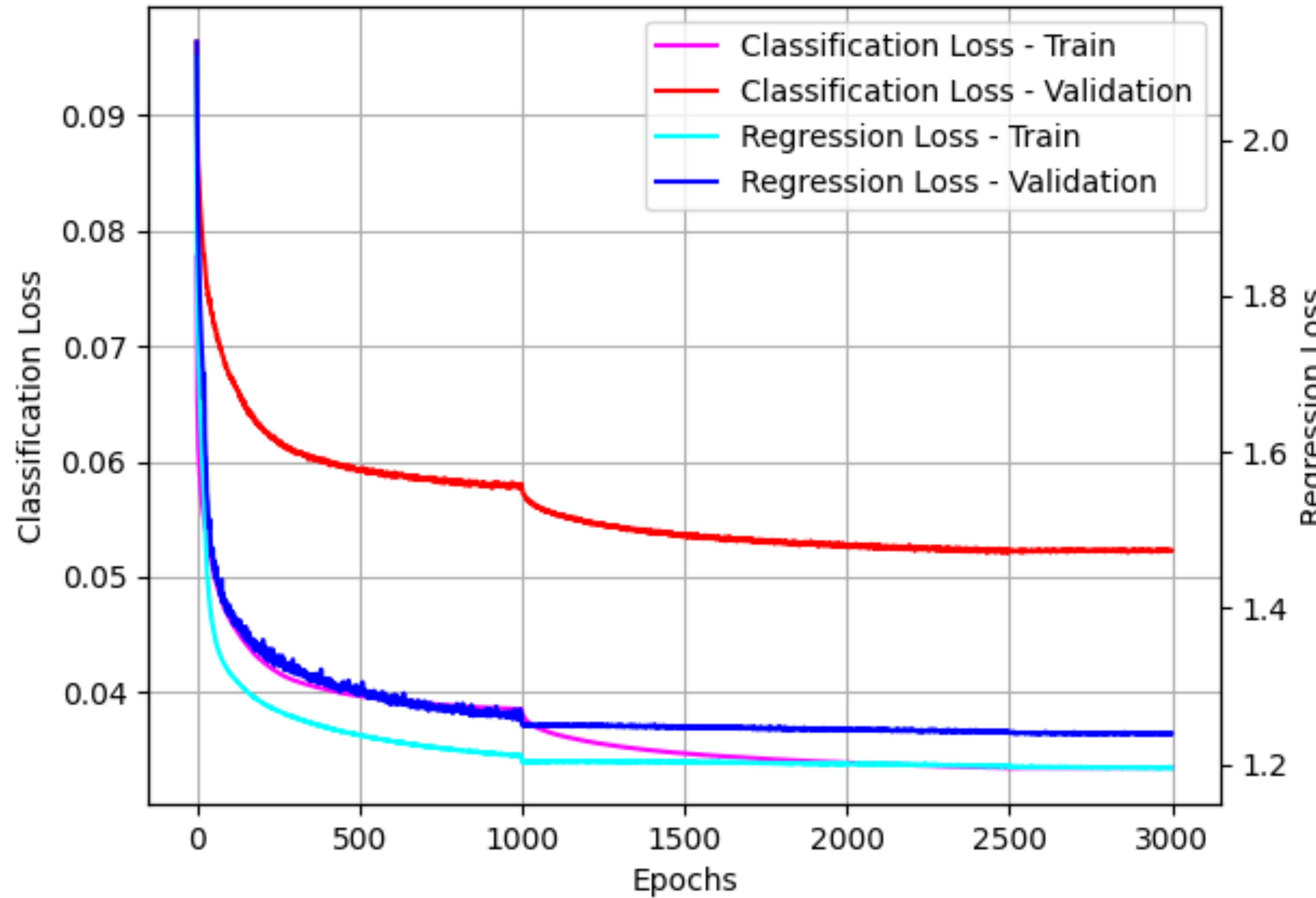


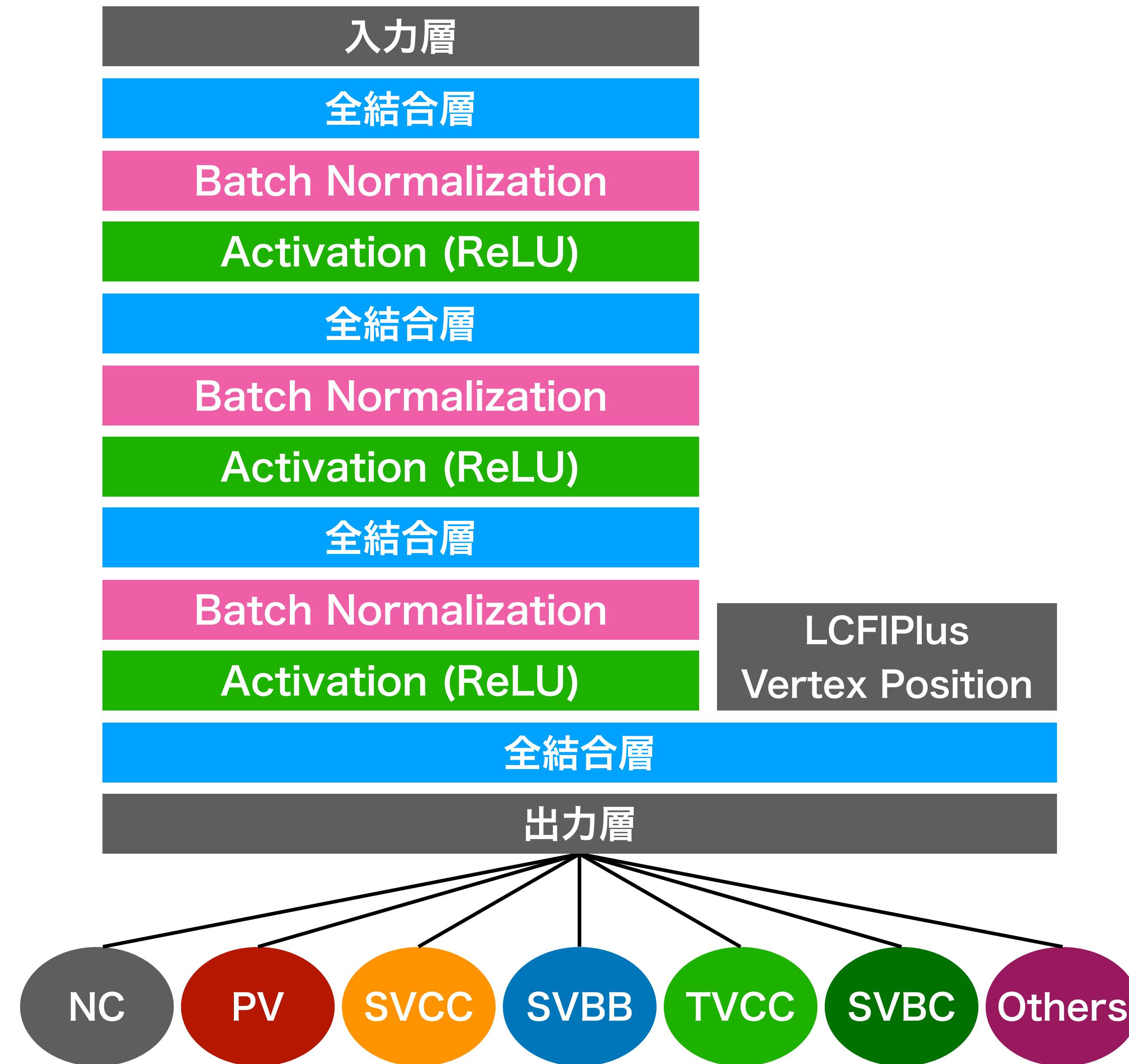
データサンプル $c\bar{c}$ – 03, 04, $b\bar{b}$ – 04, 05

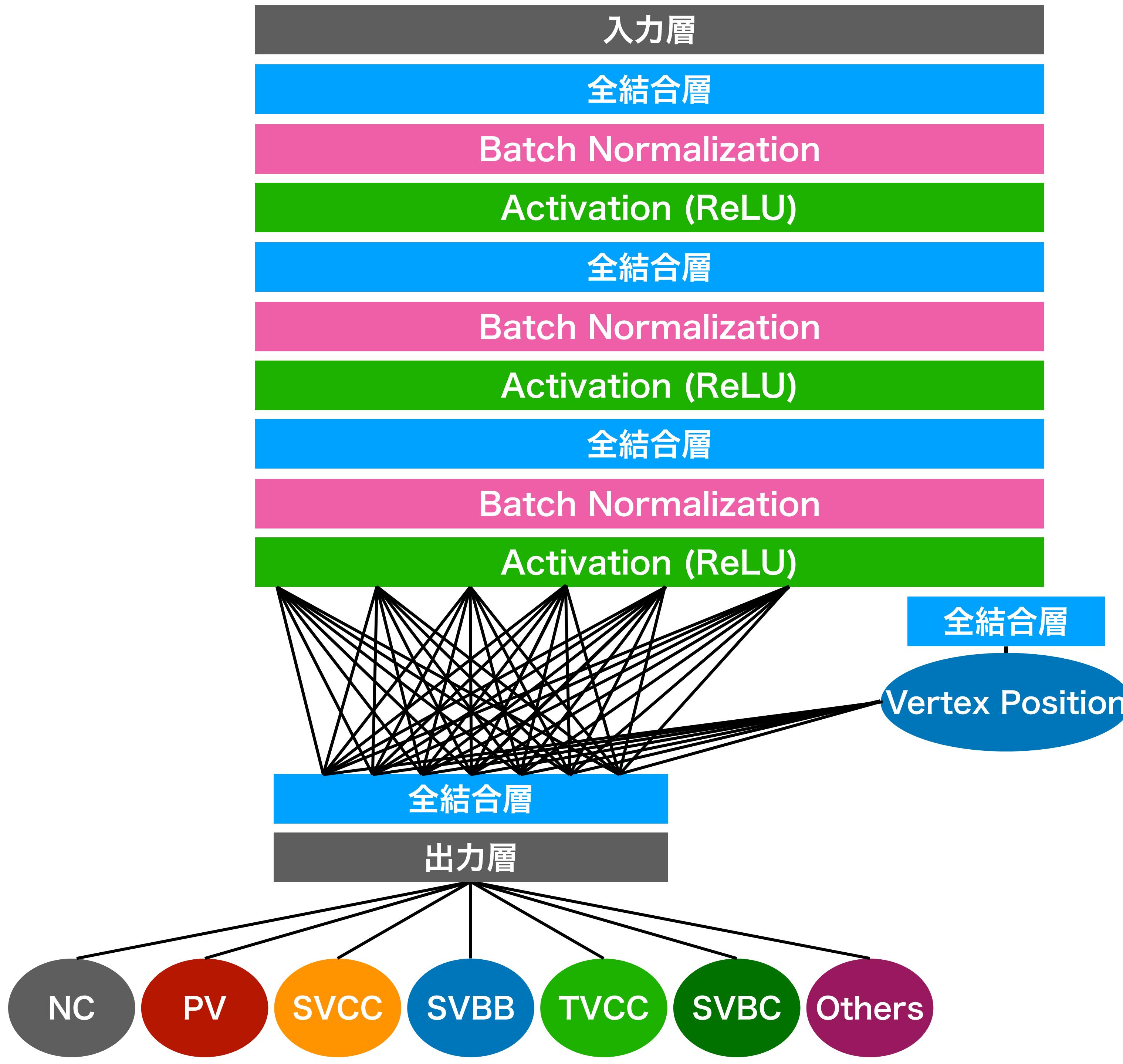


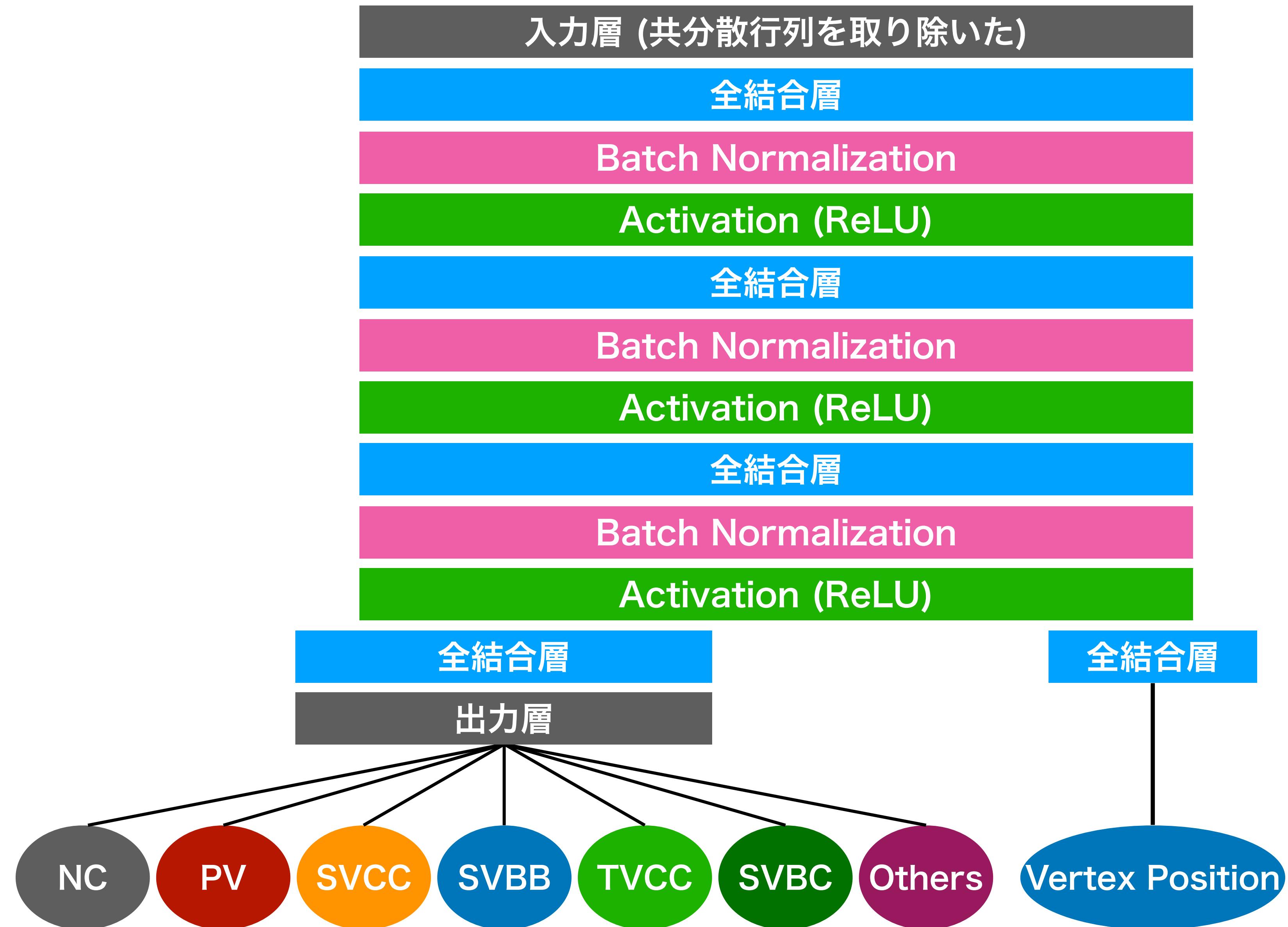


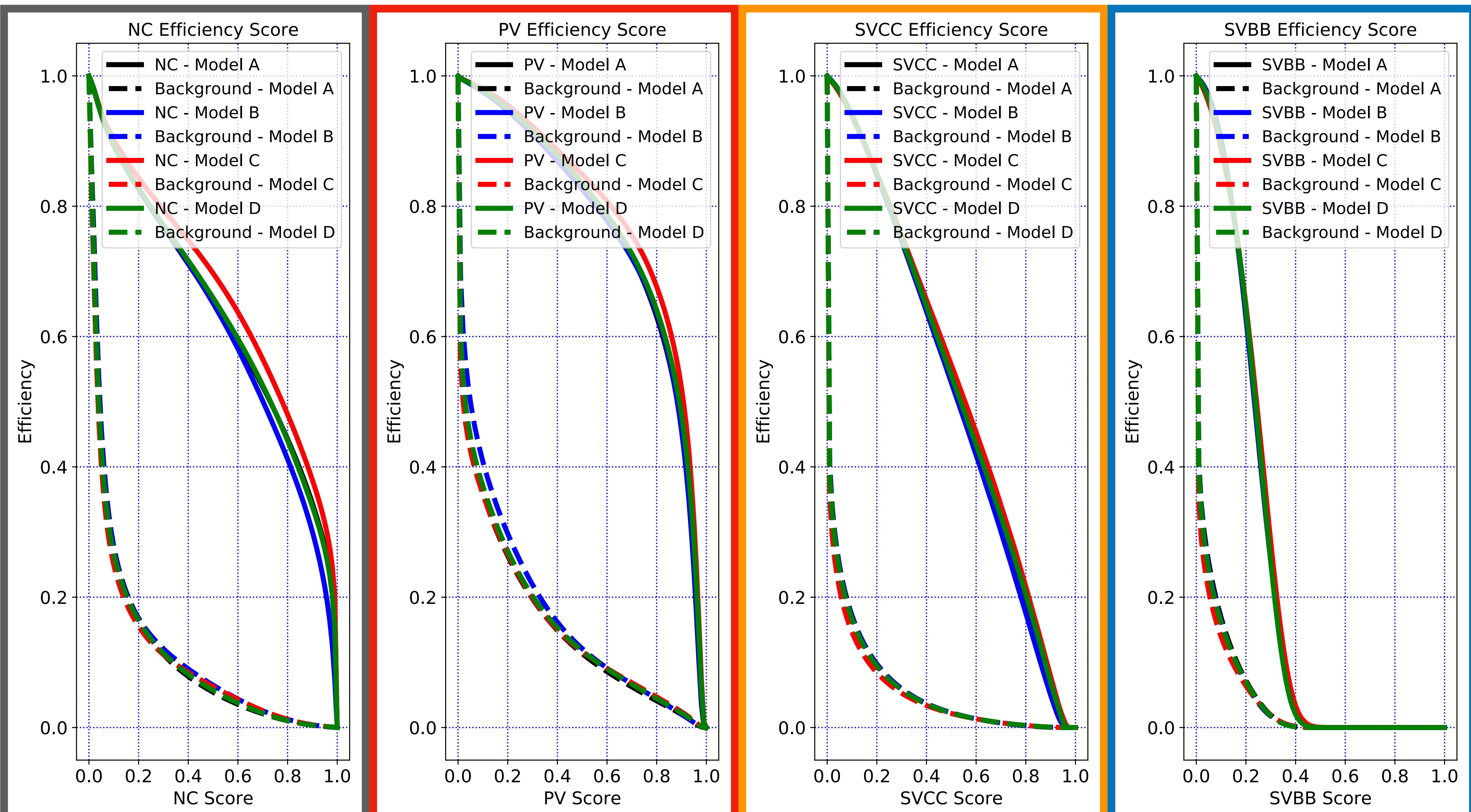


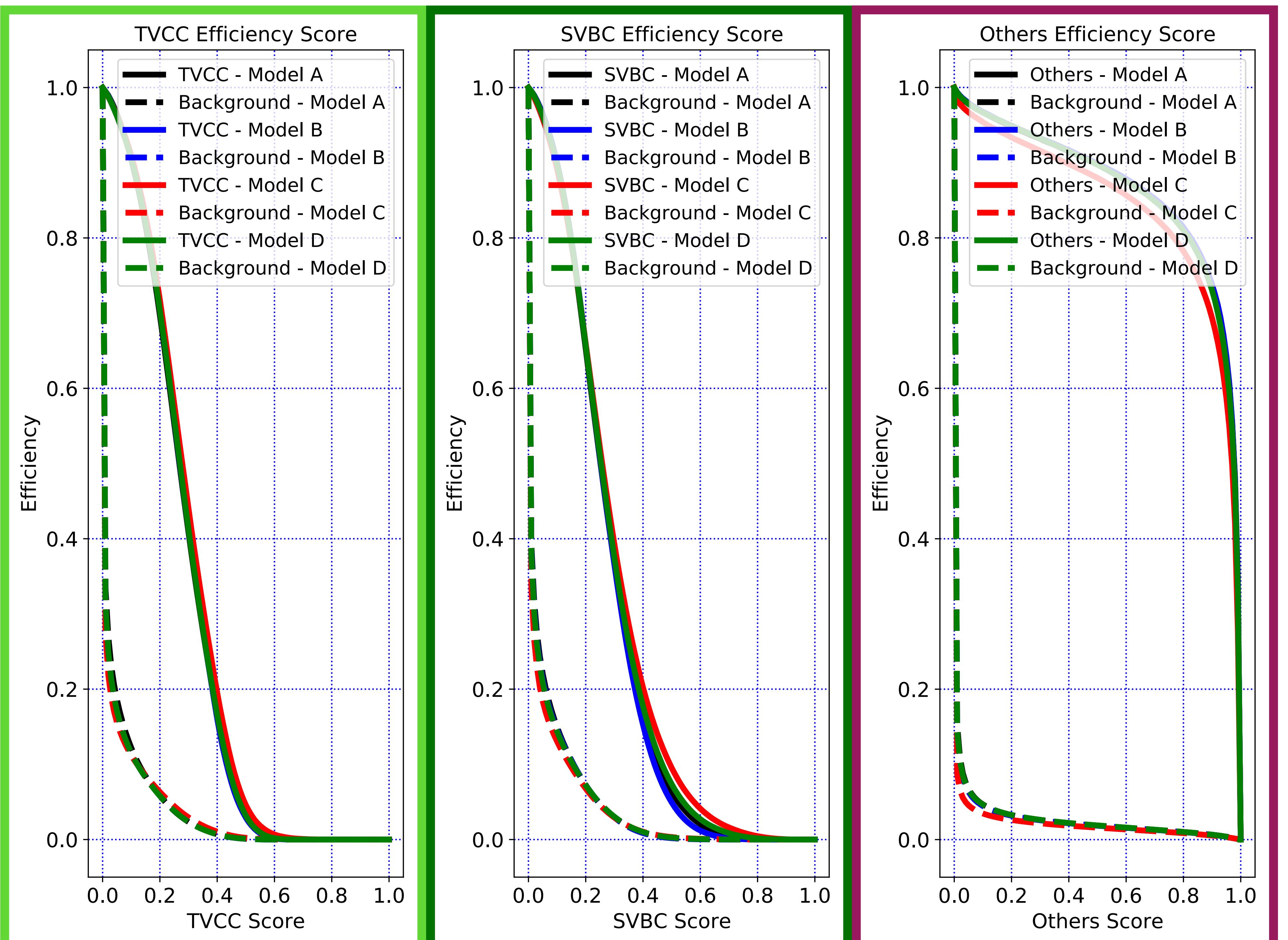


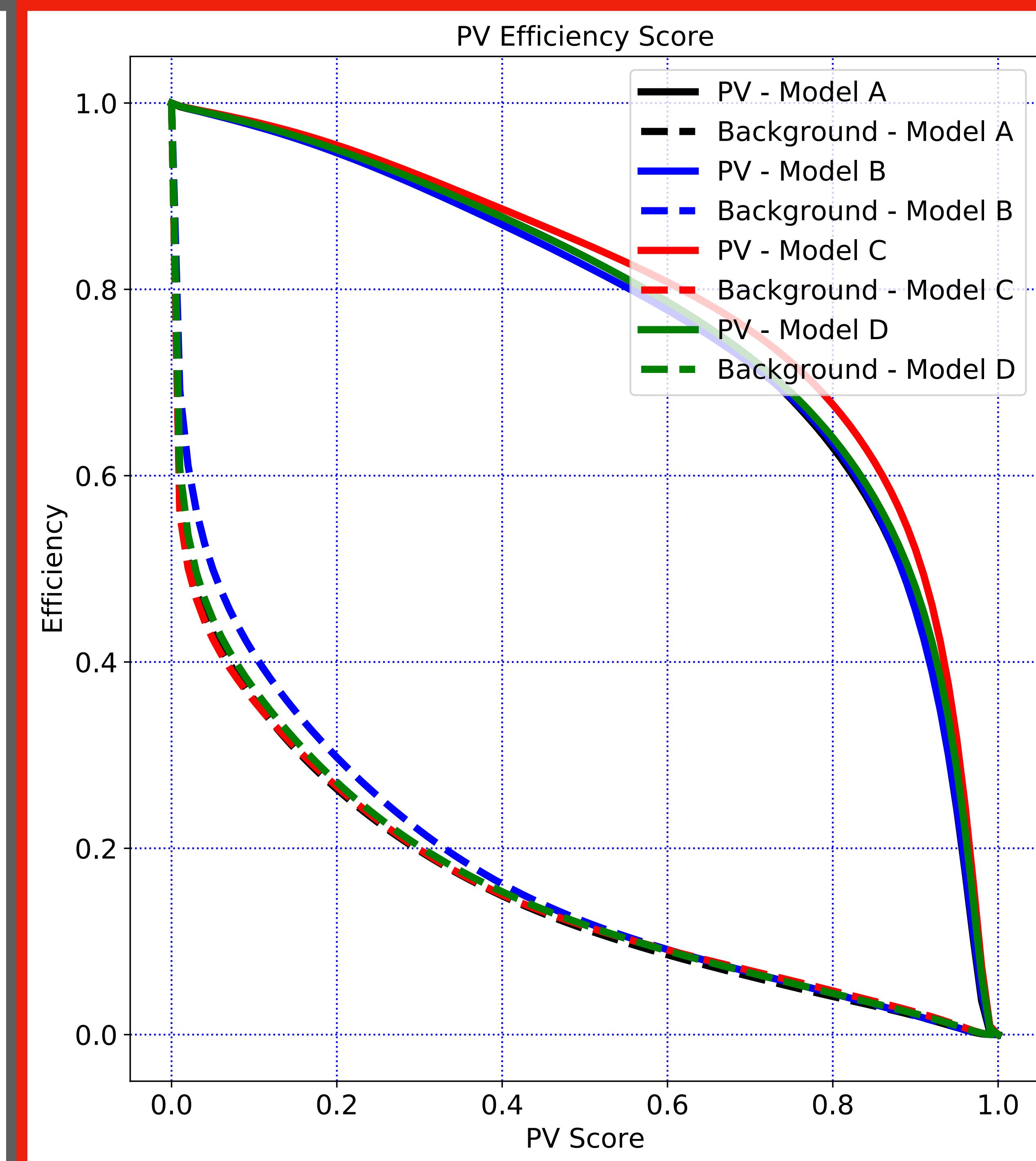
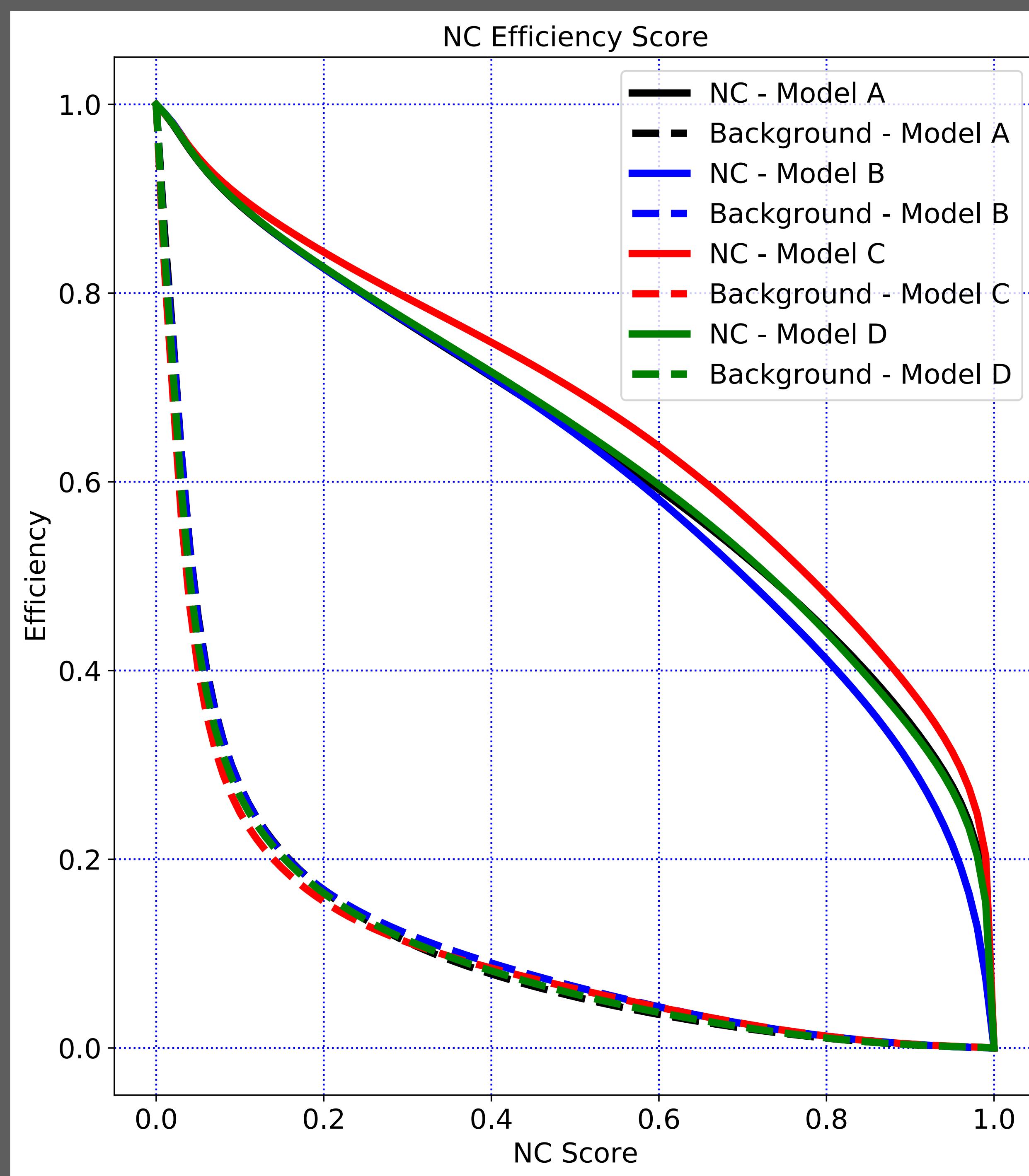


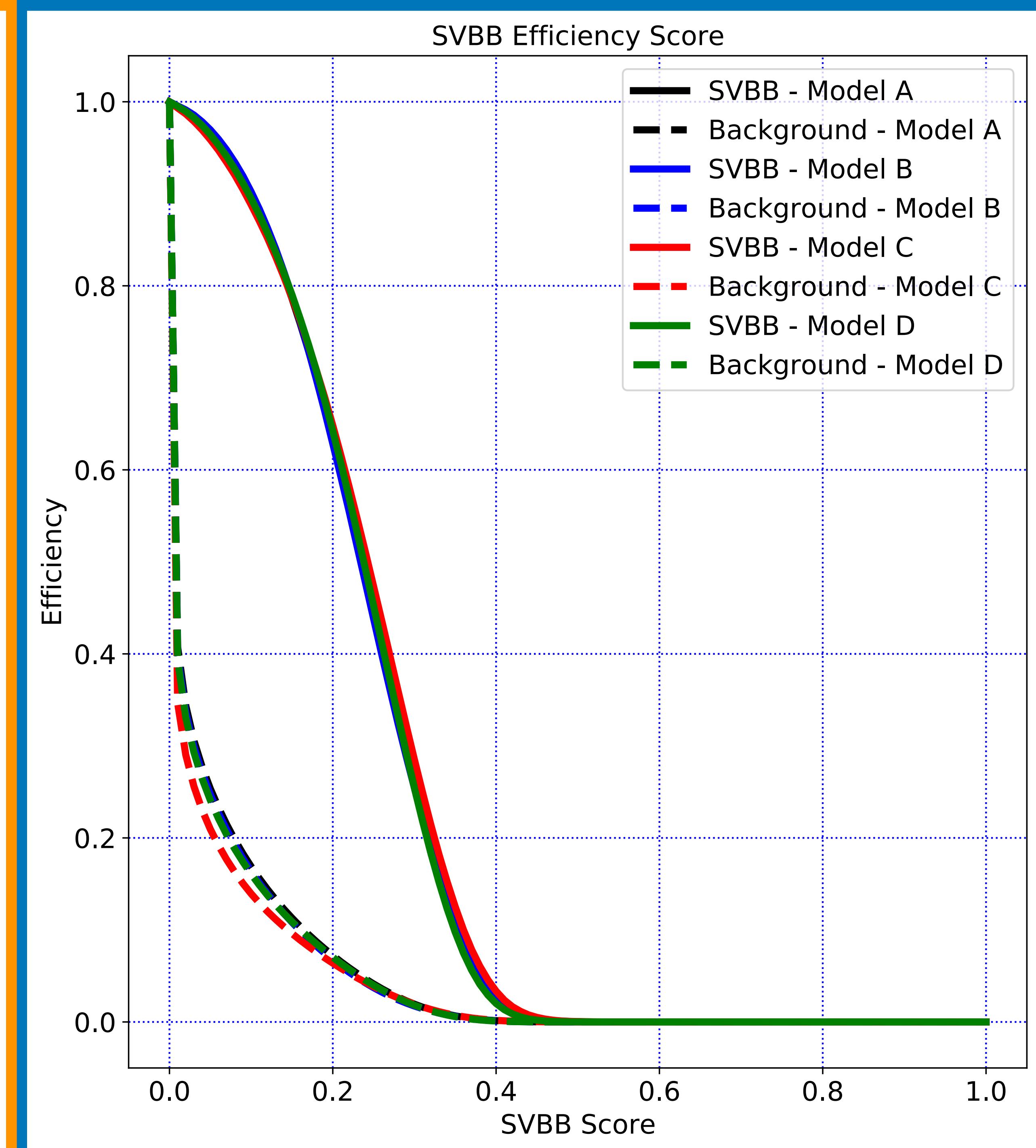
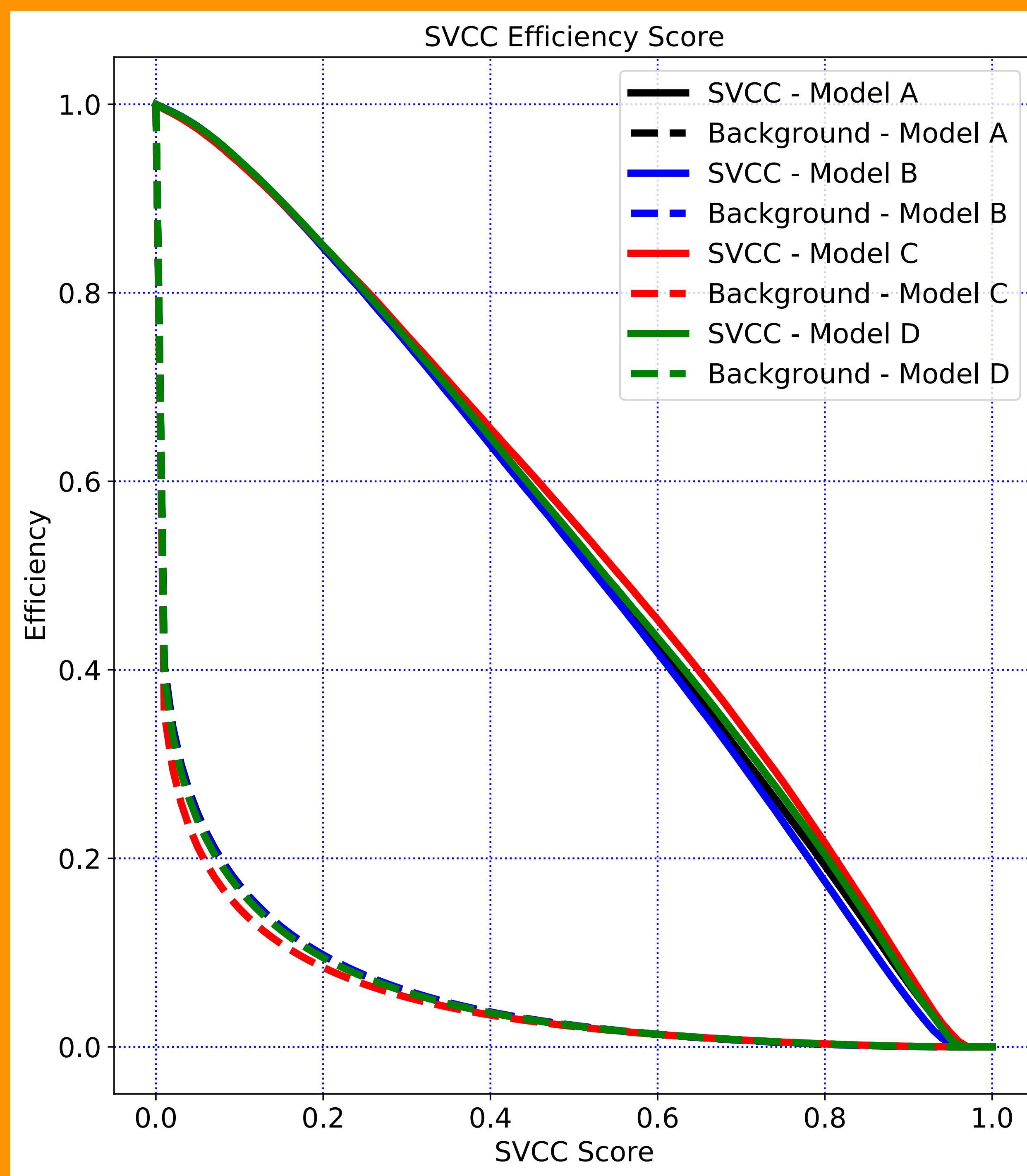




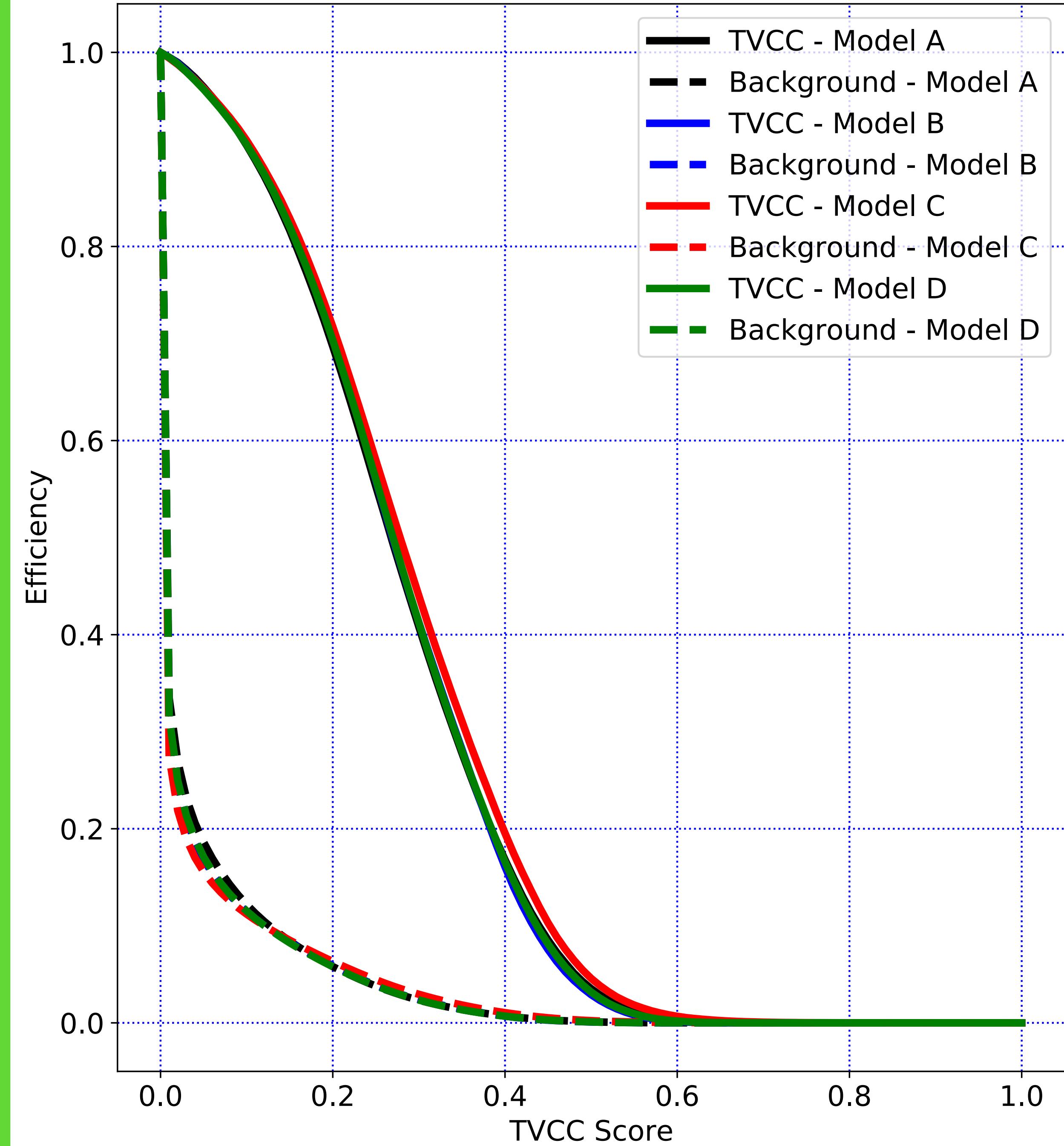




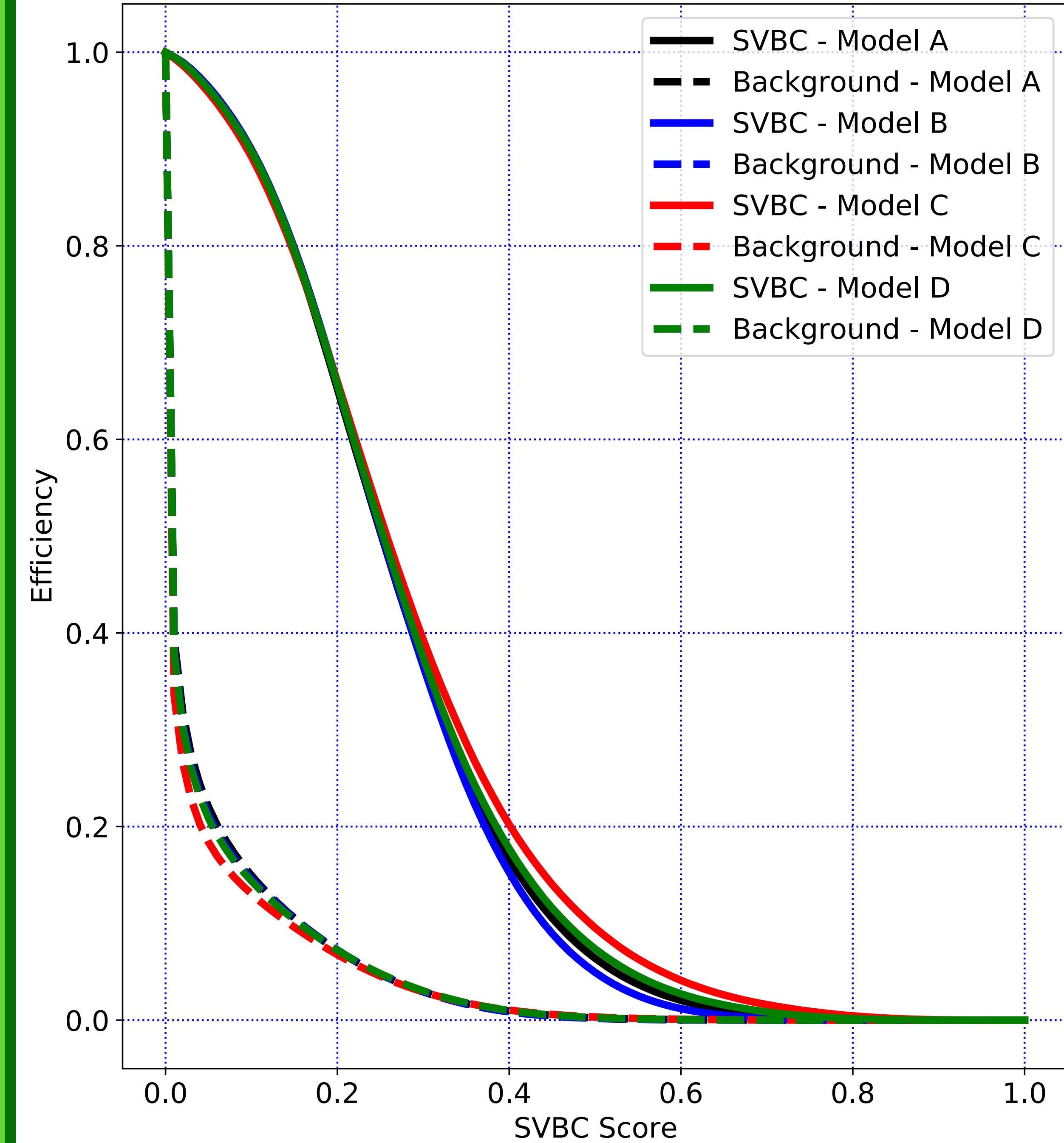




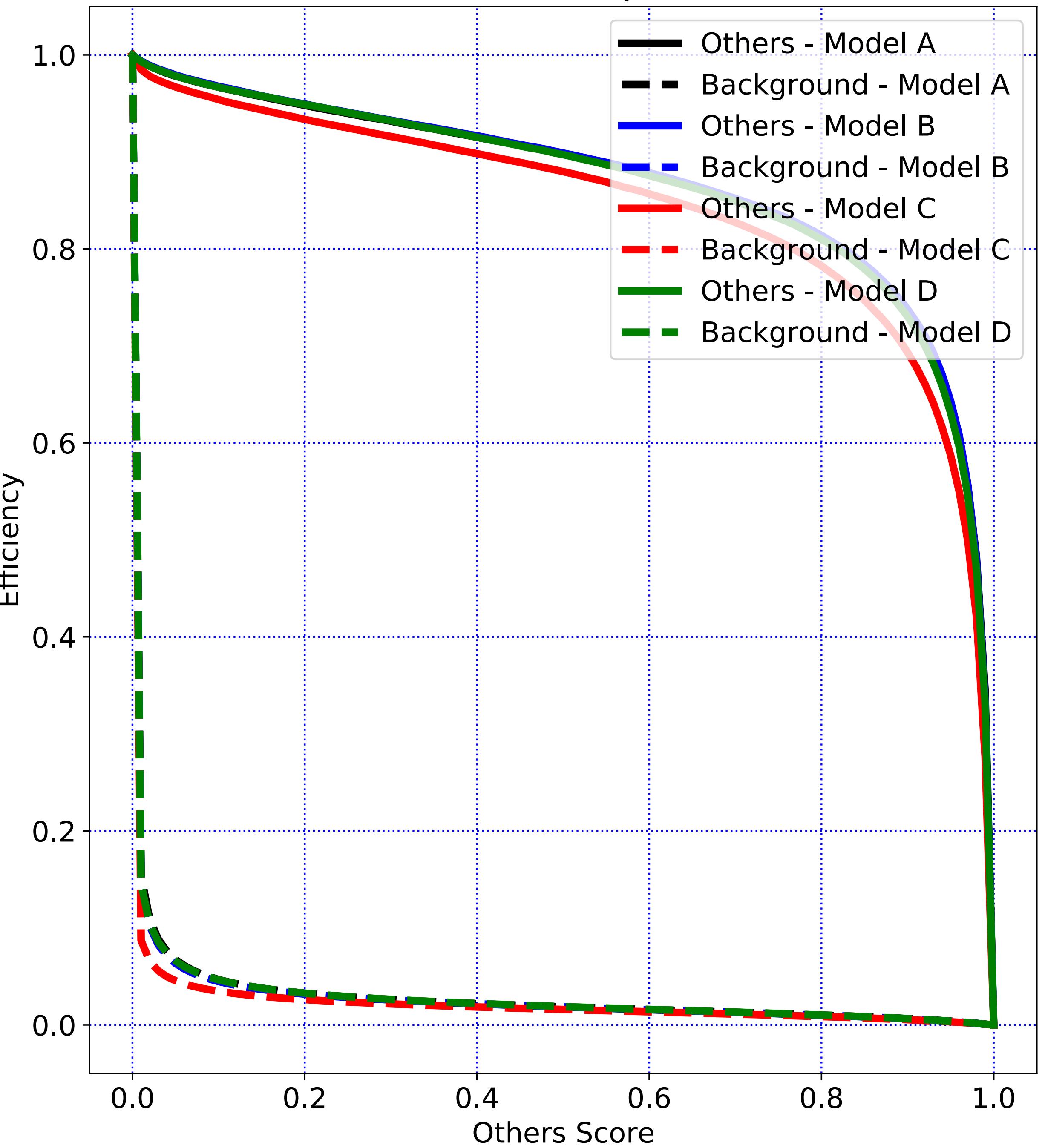
TVCC Efficiency Score

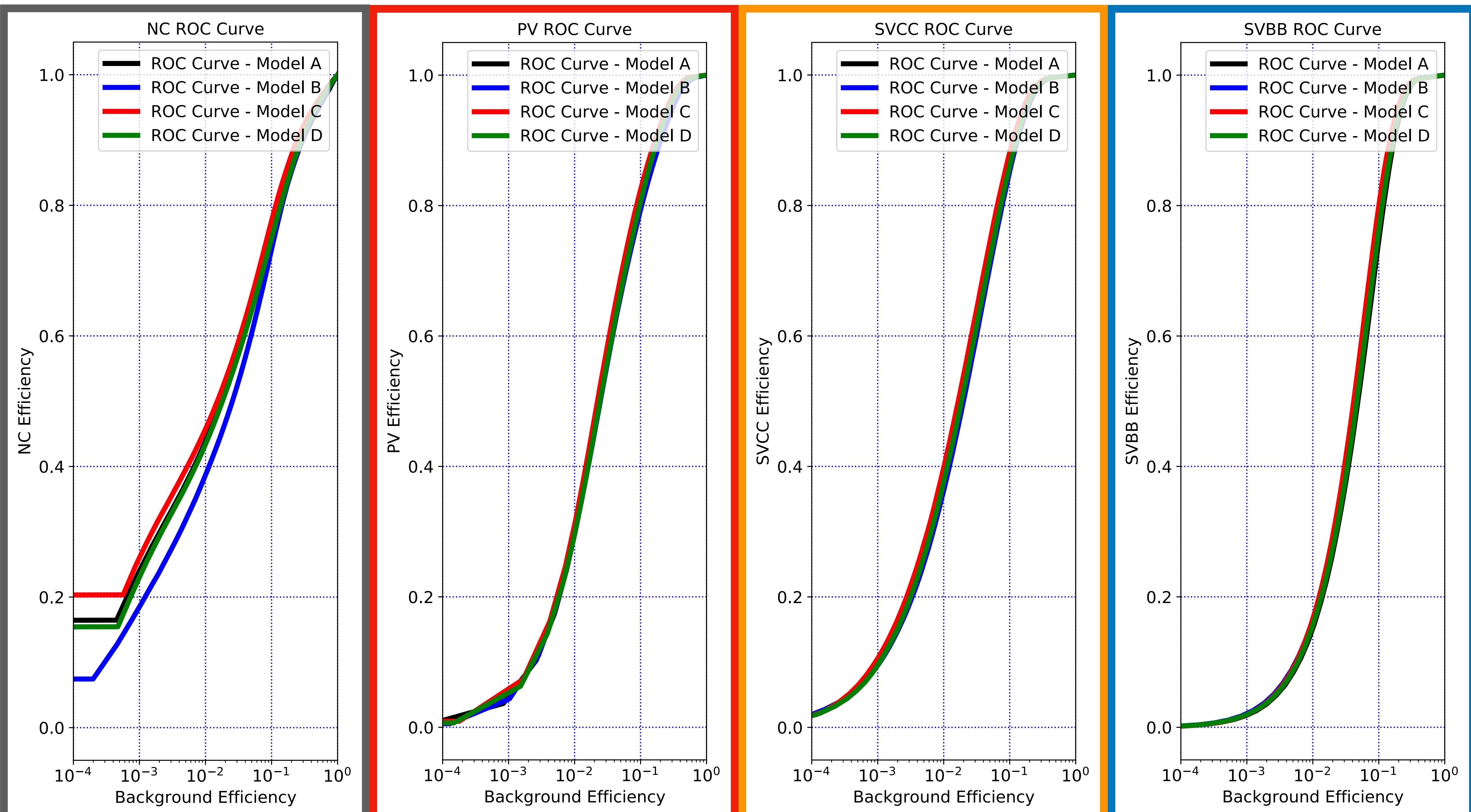


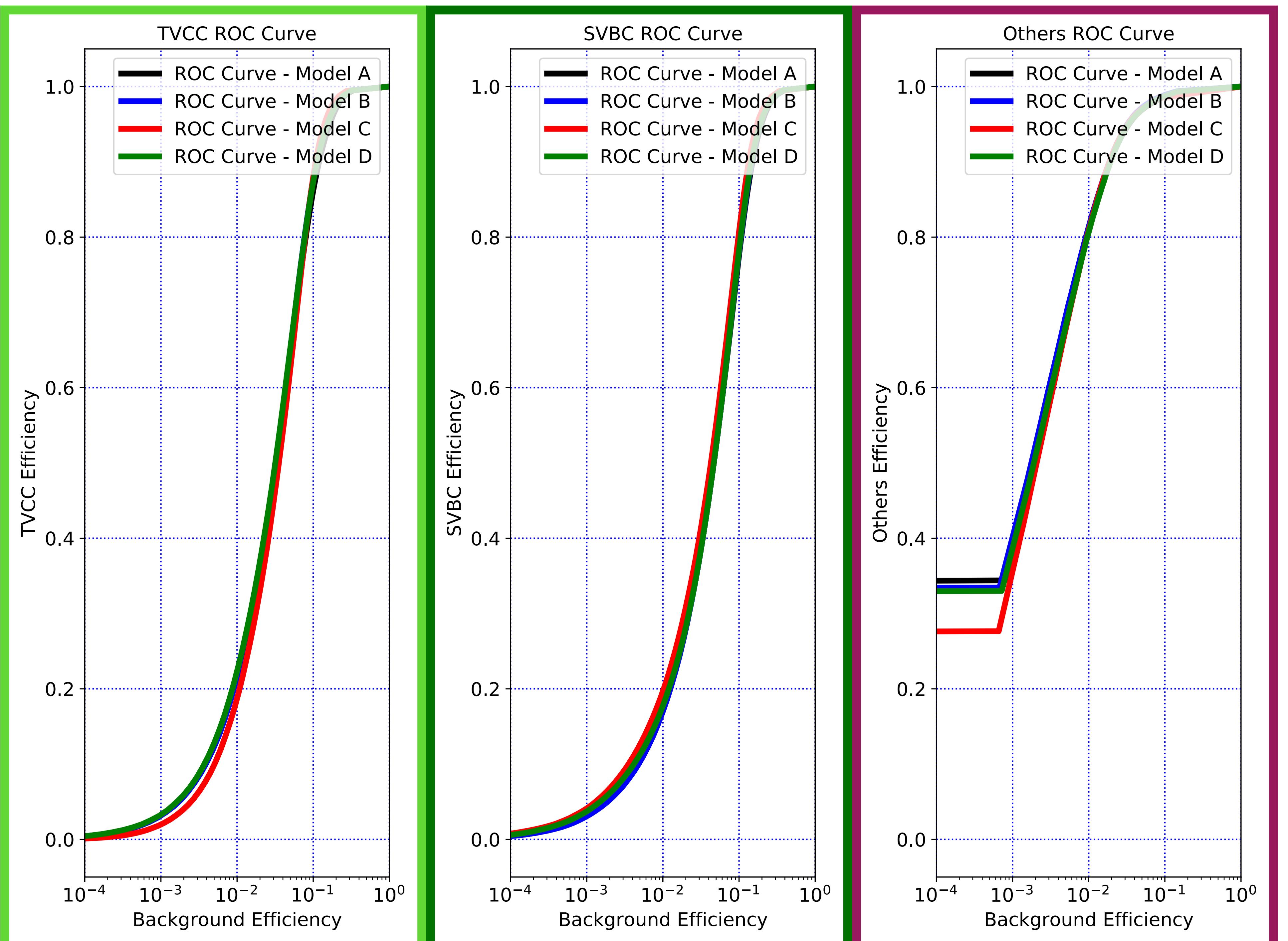
SVBC Efficiency Score



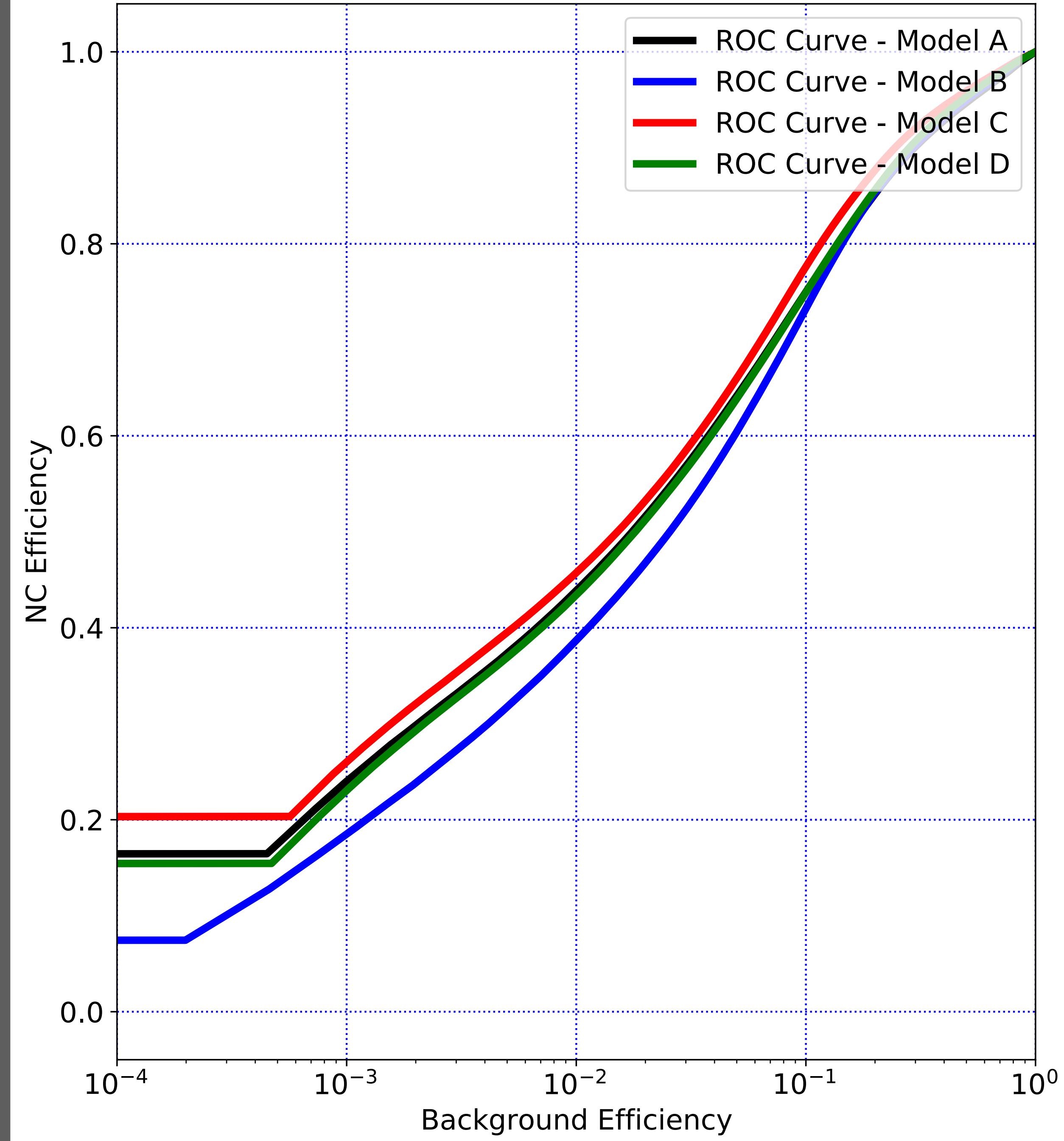
Others Efficiency Score



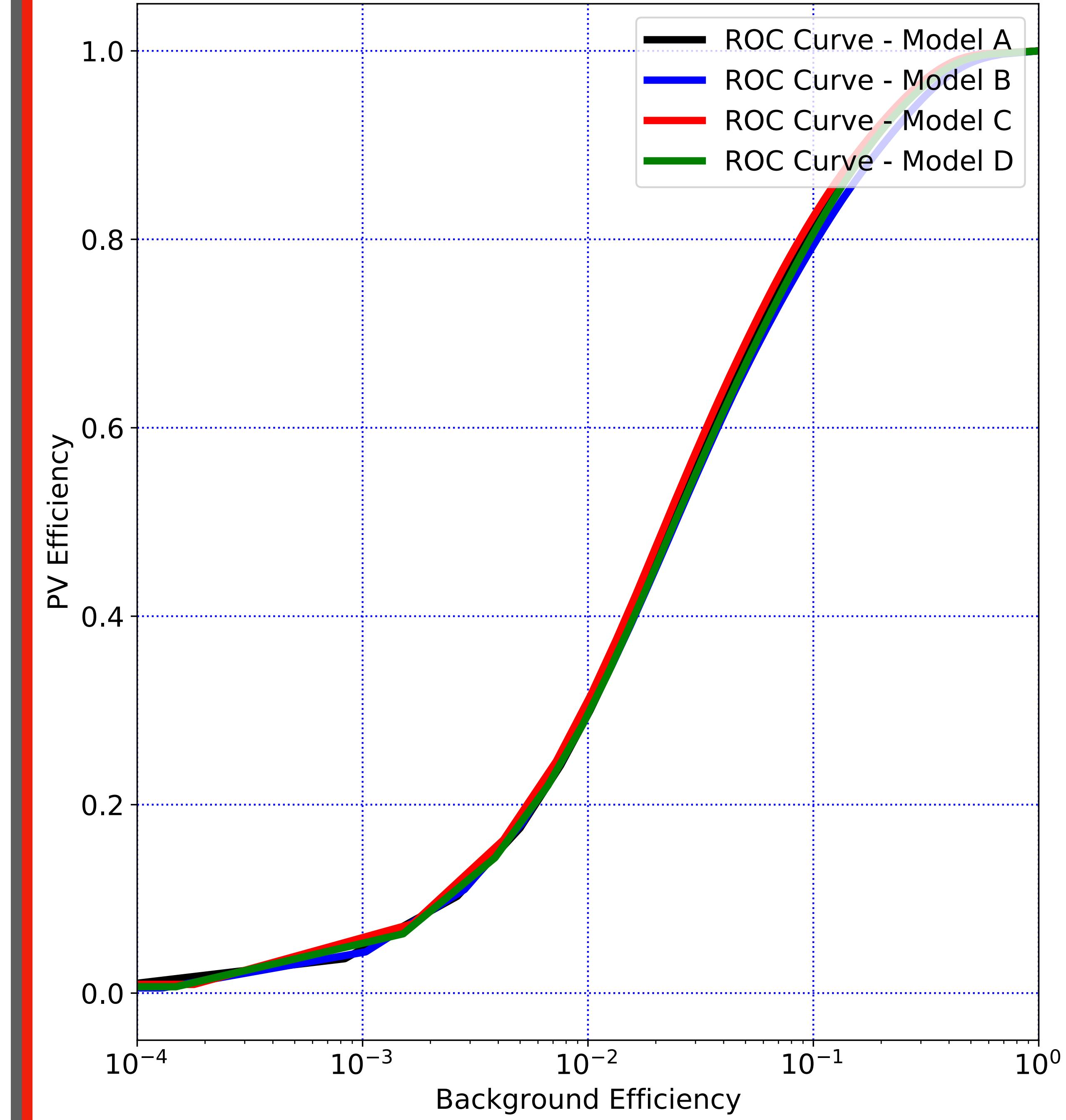




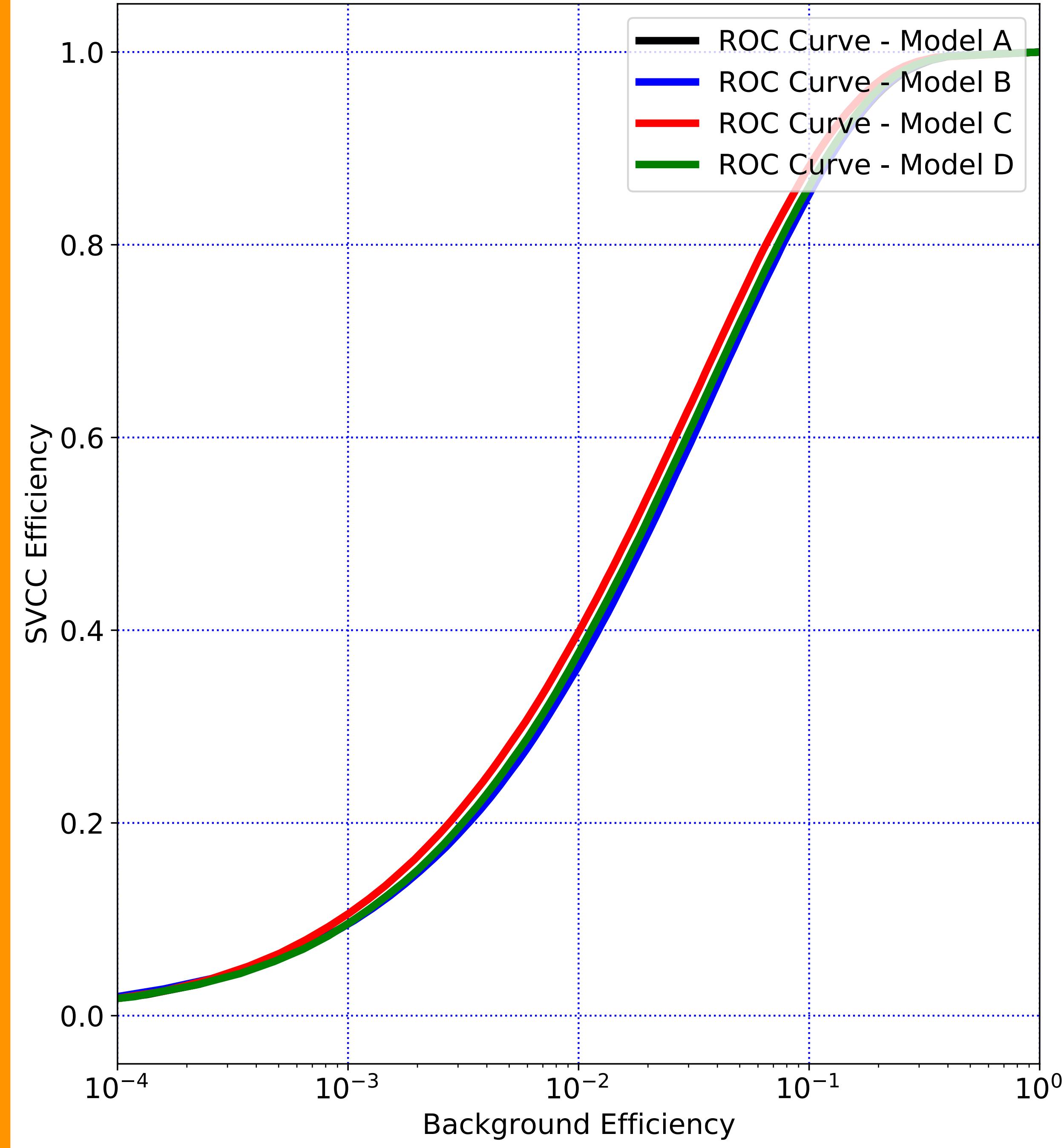
NC ROC Curve



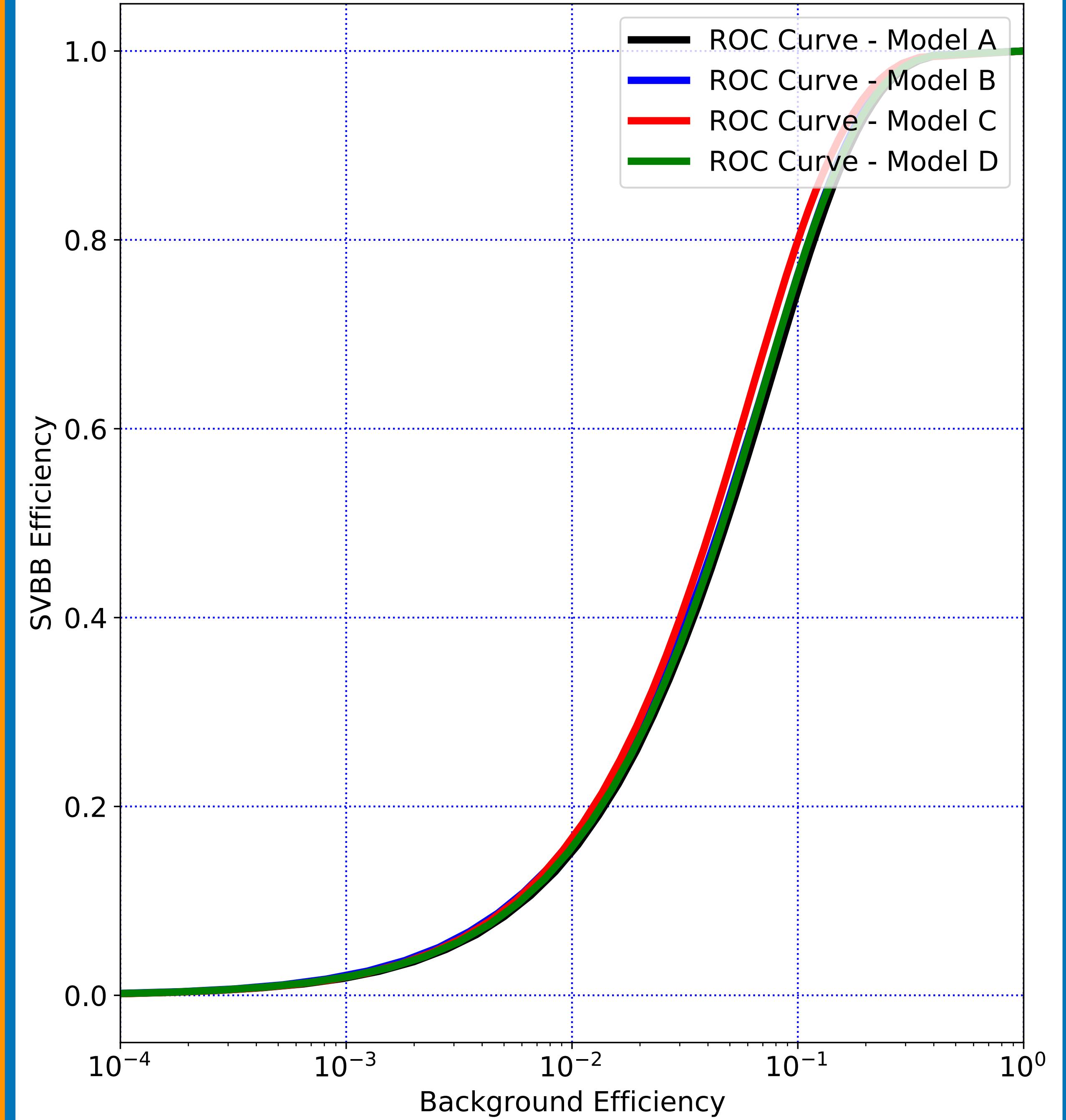
PV ROC Curve



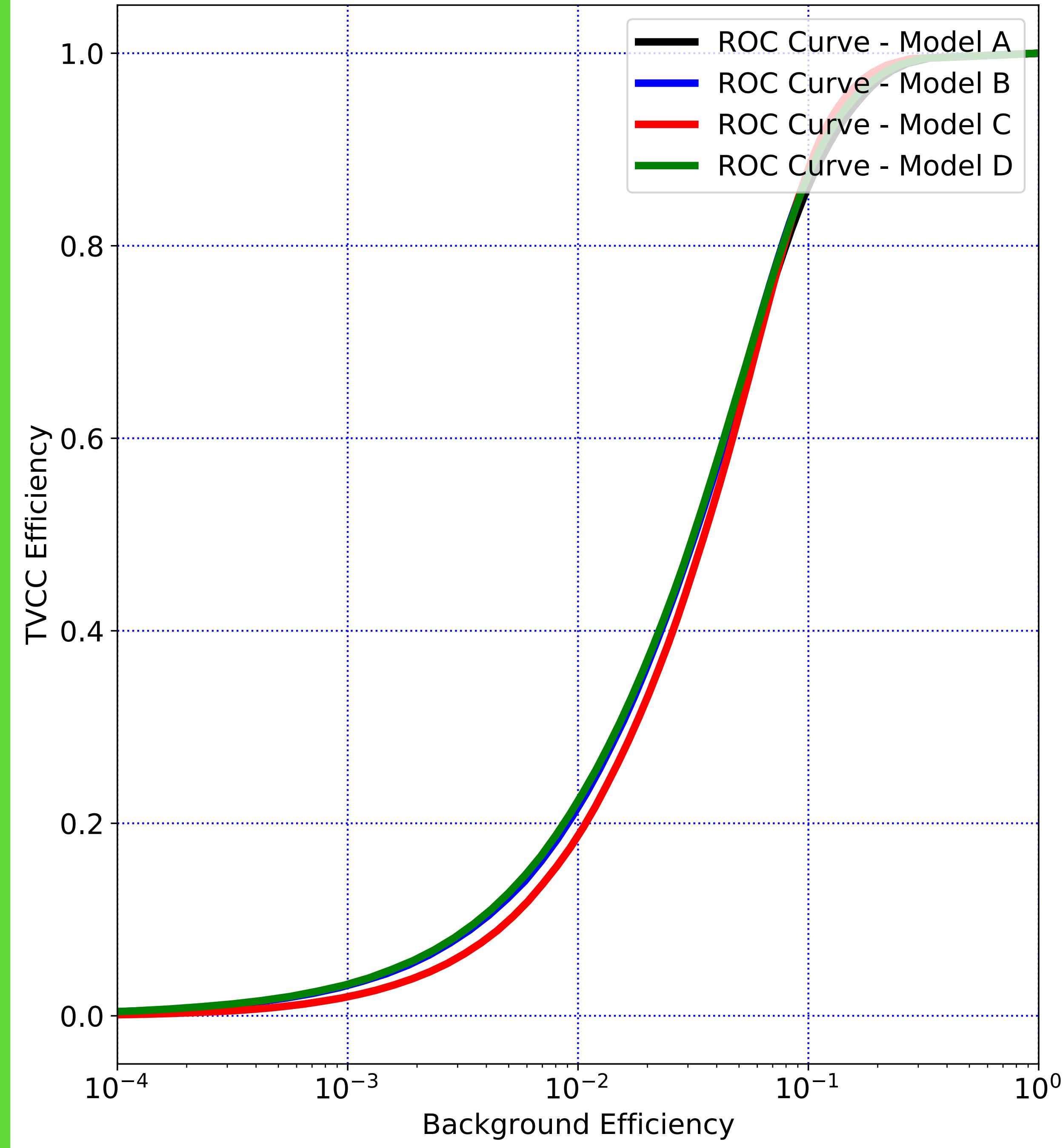
SVCC ROC Curve



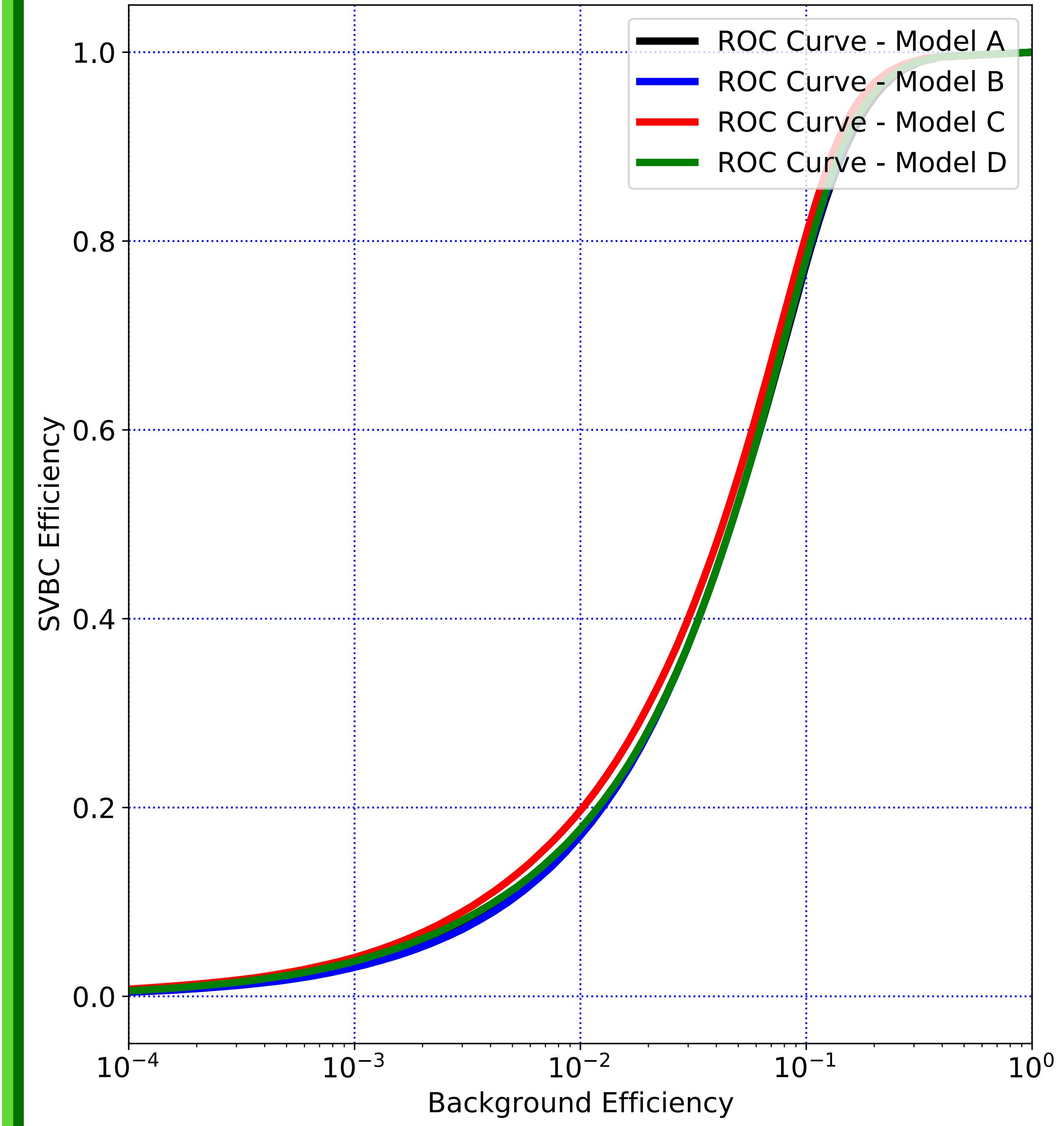
SVBB ROC Curve



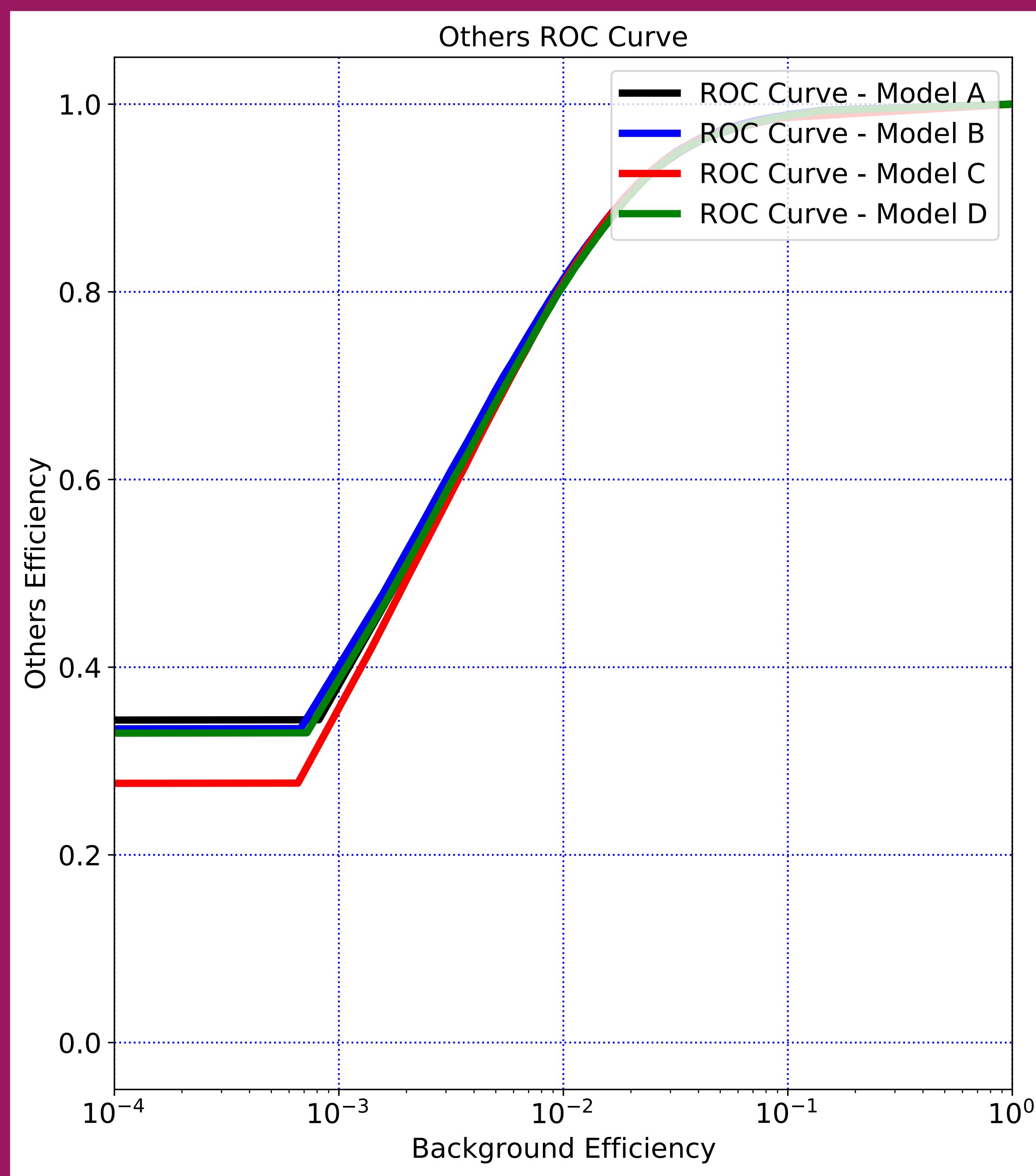
TVCC ROC Curve

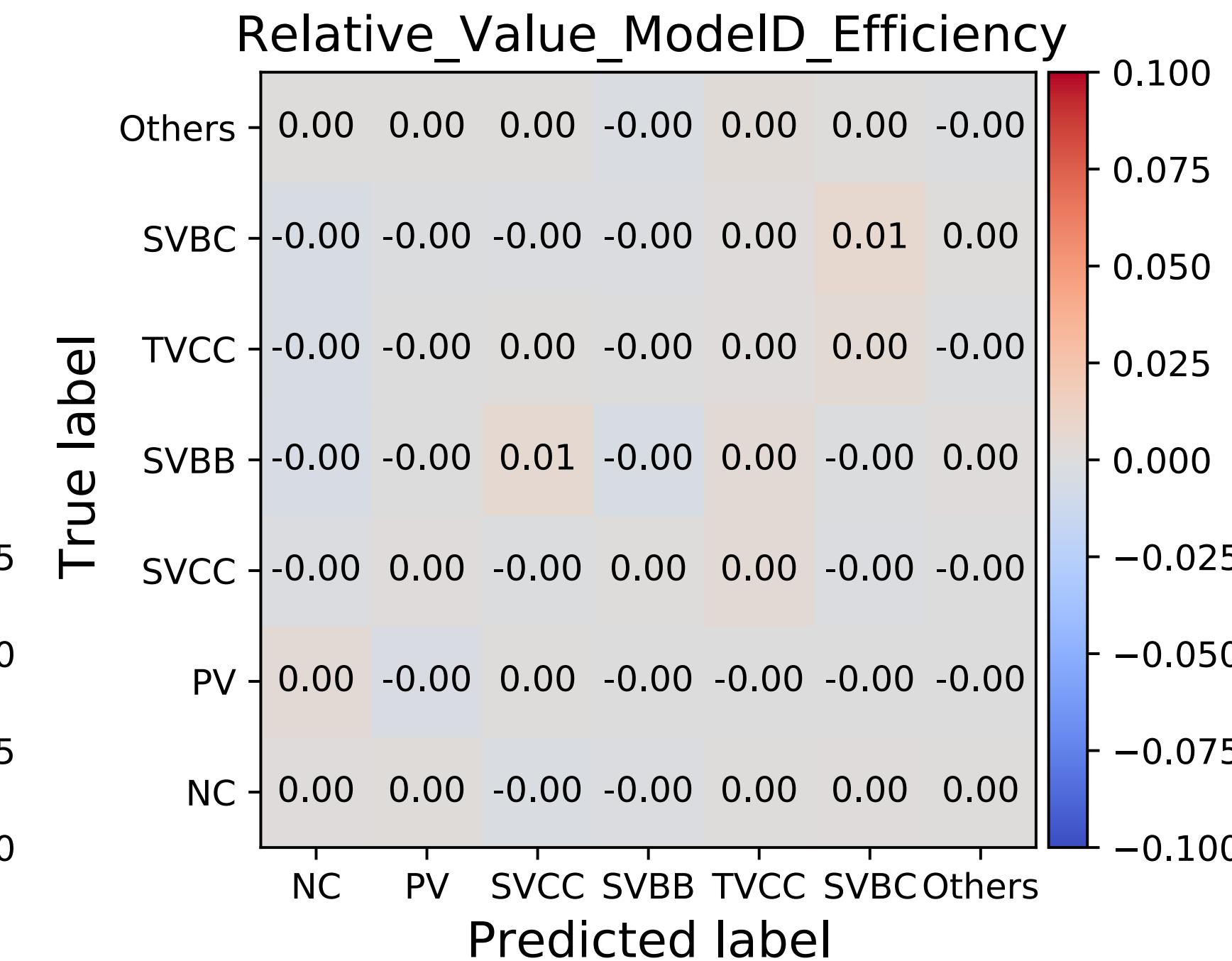
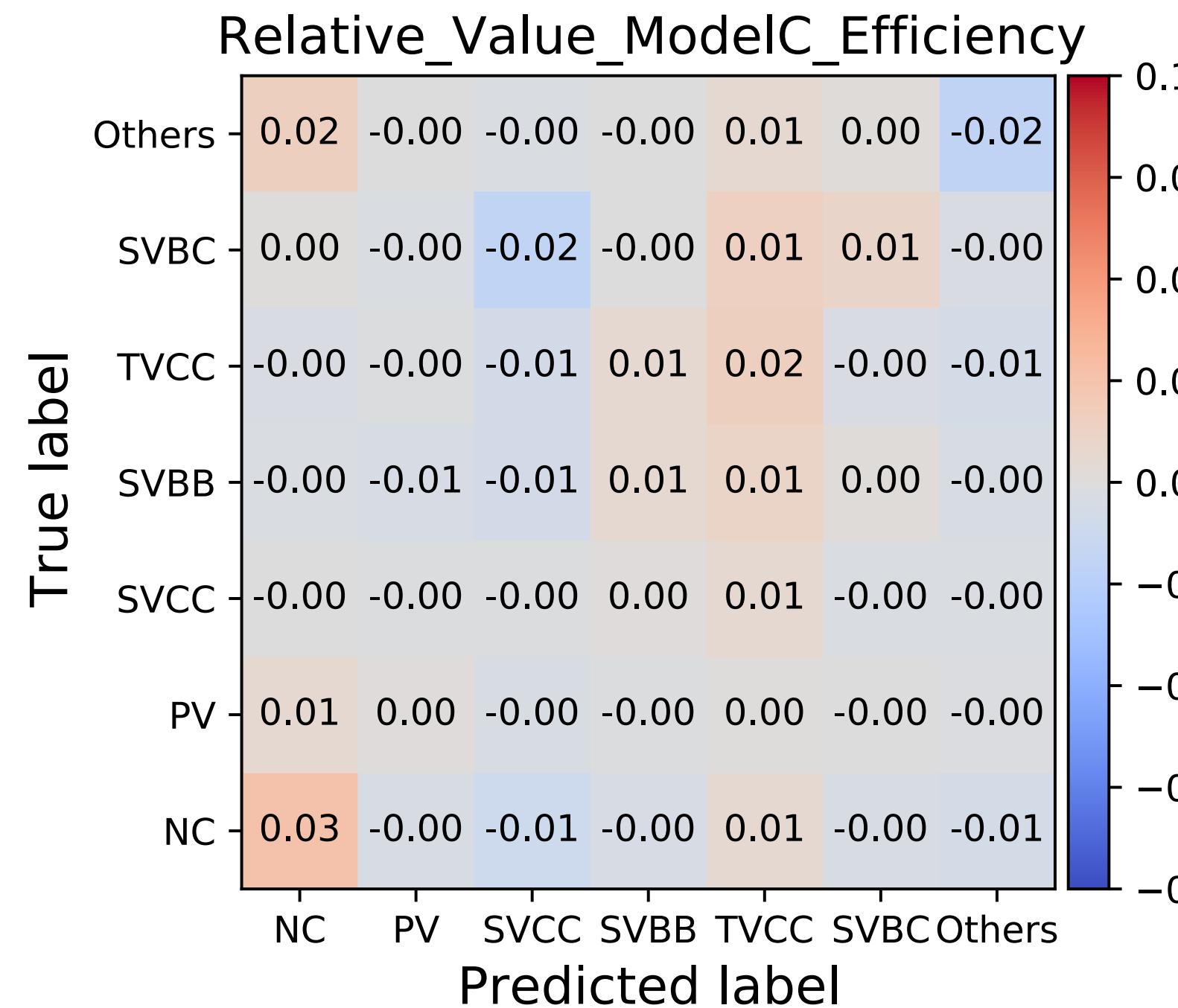
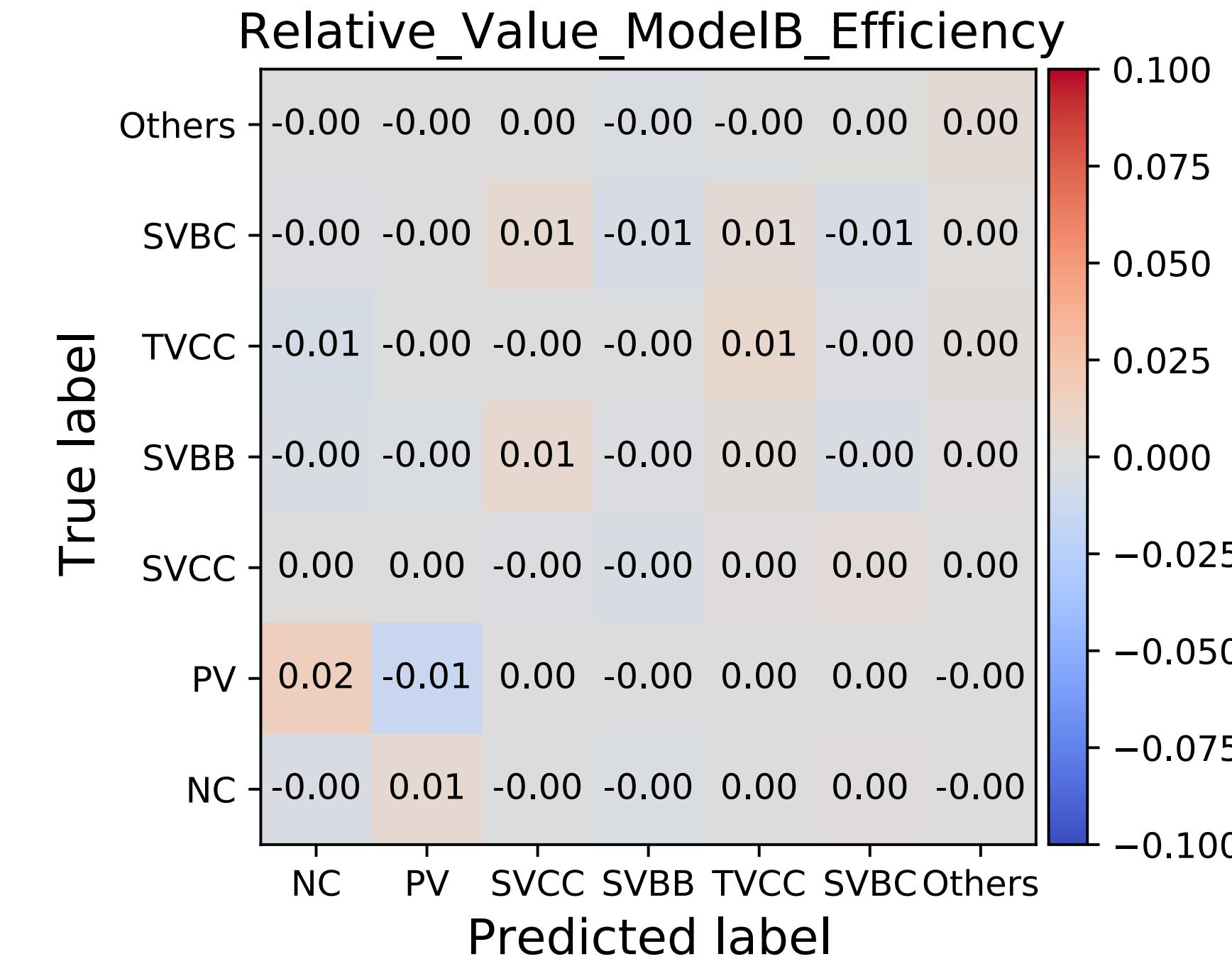
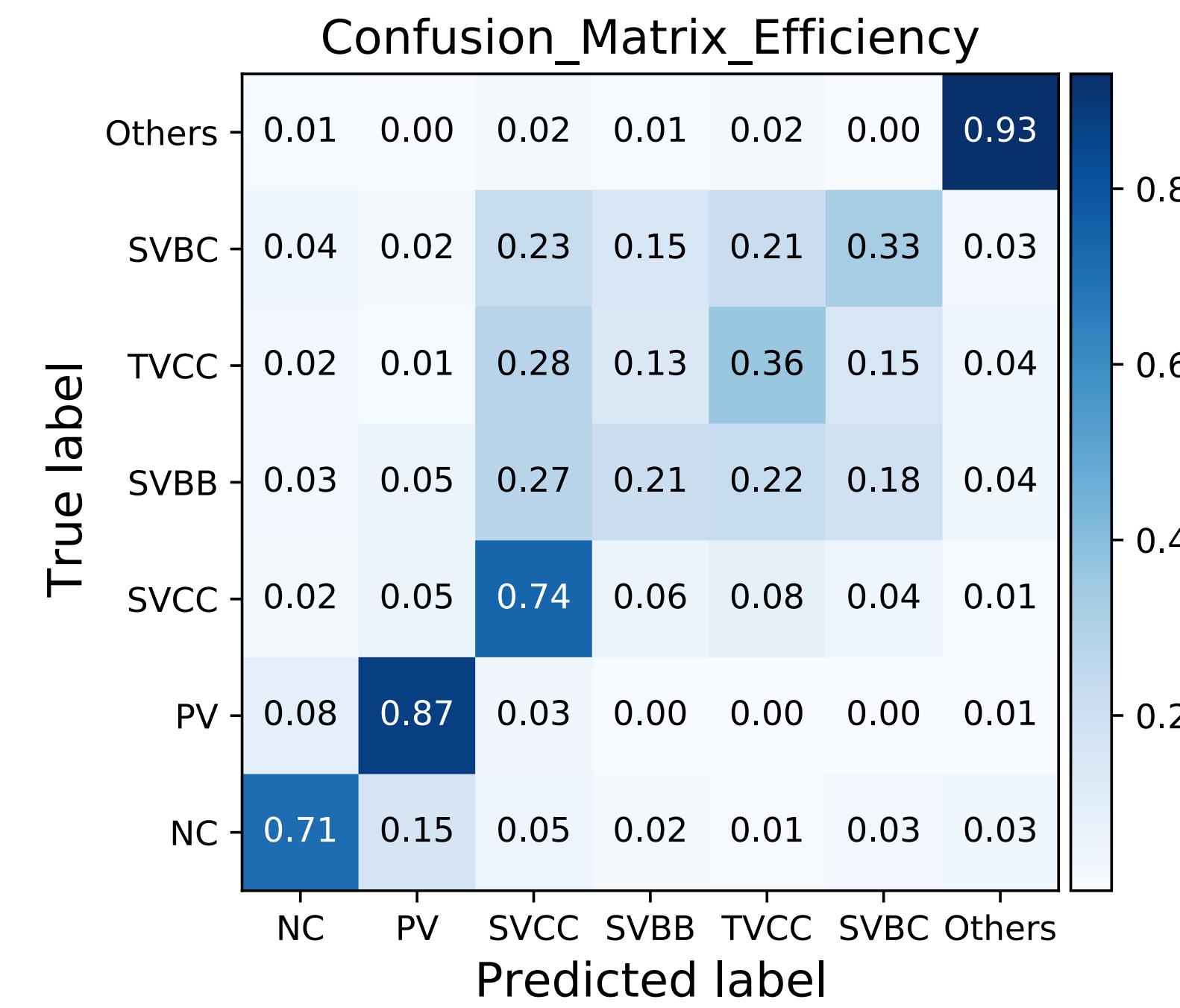


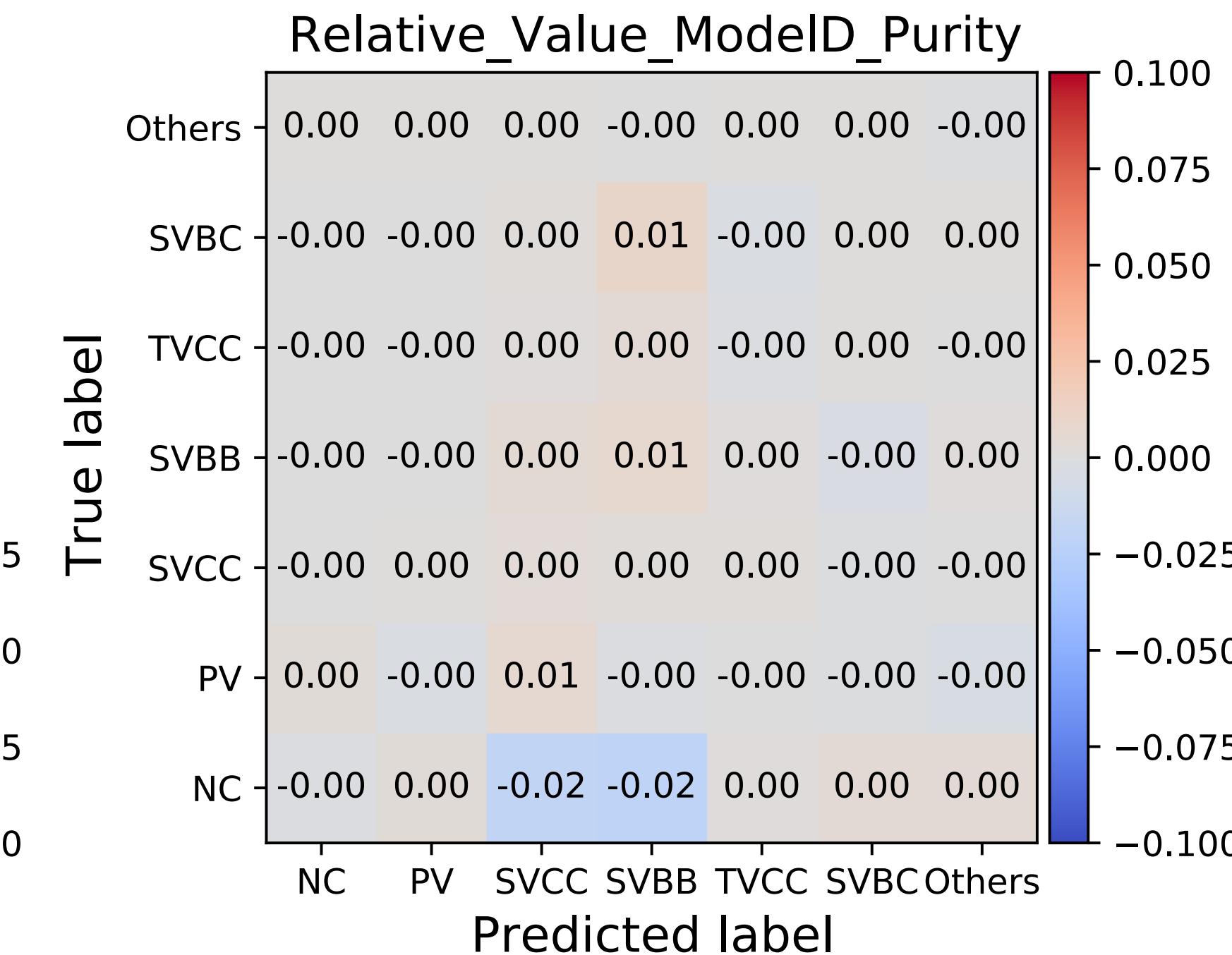
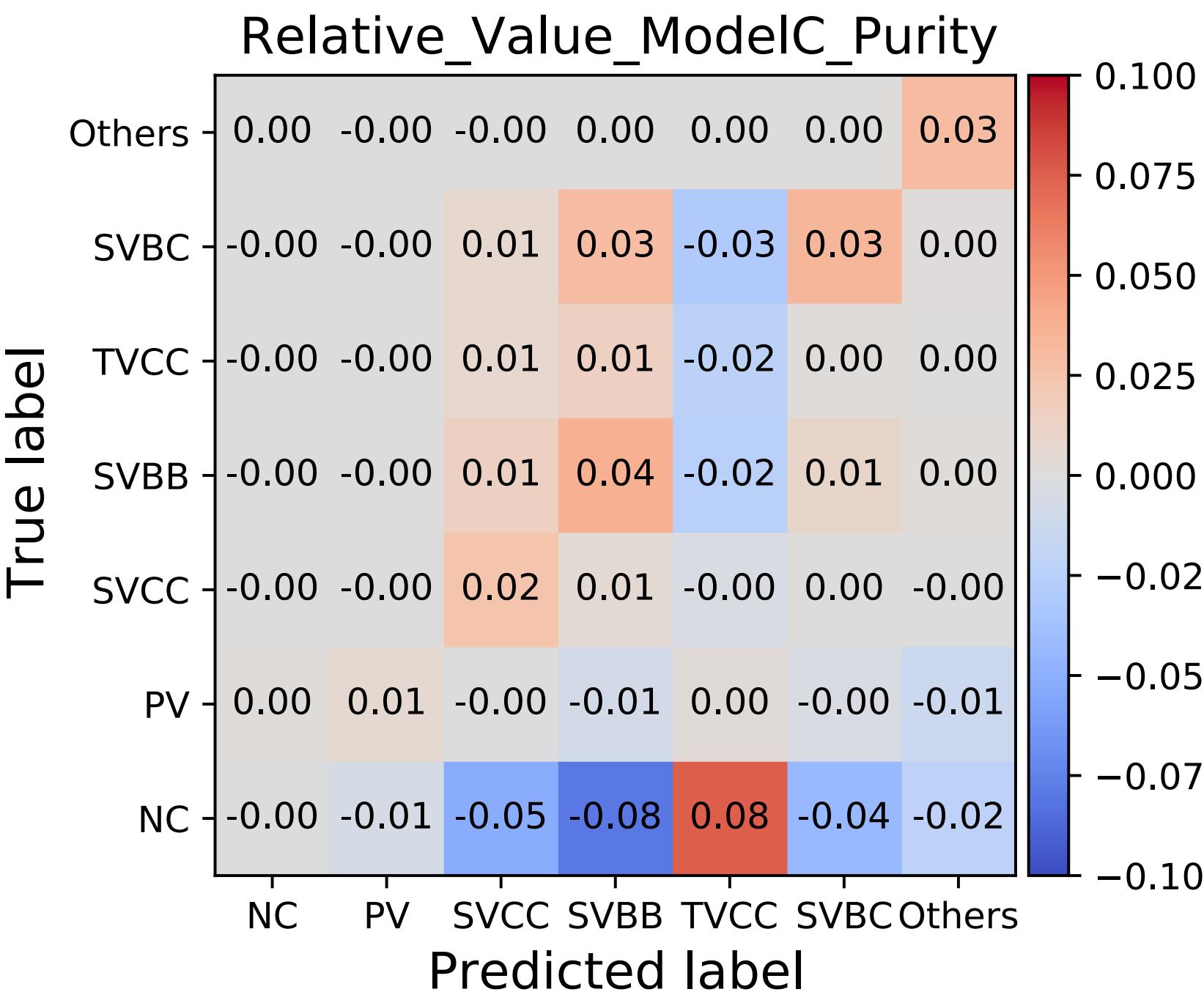
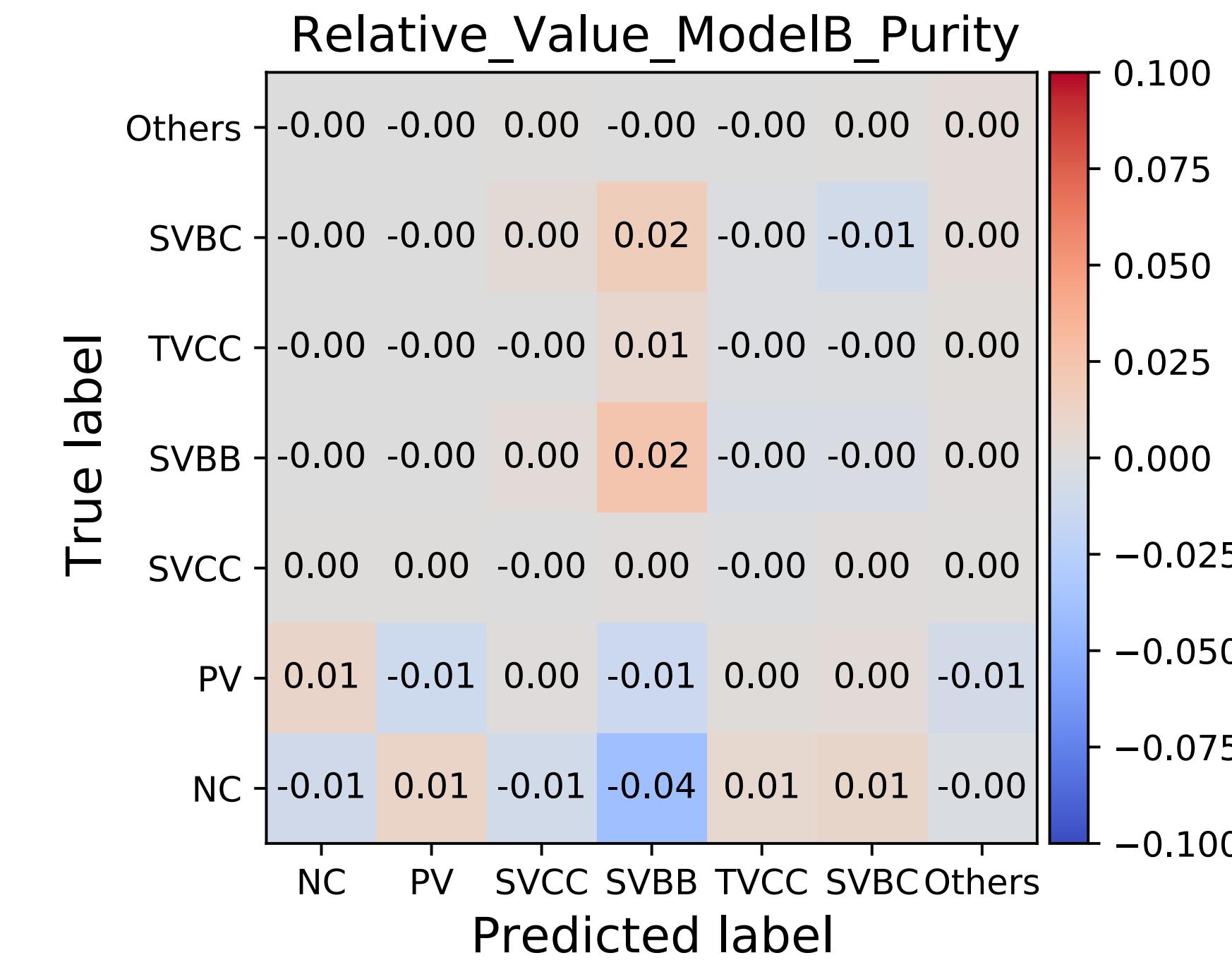
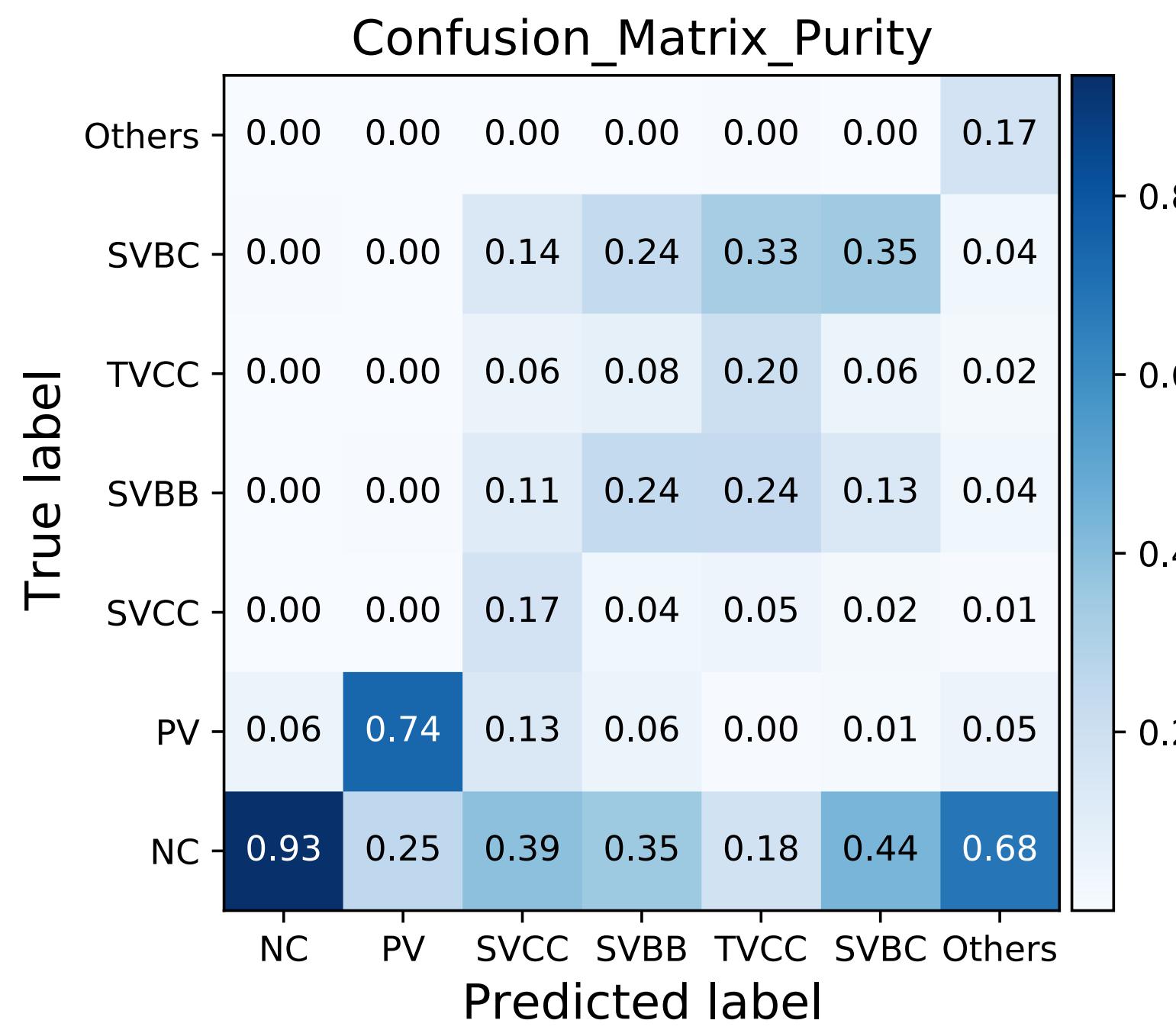
SVBC ROC Curve



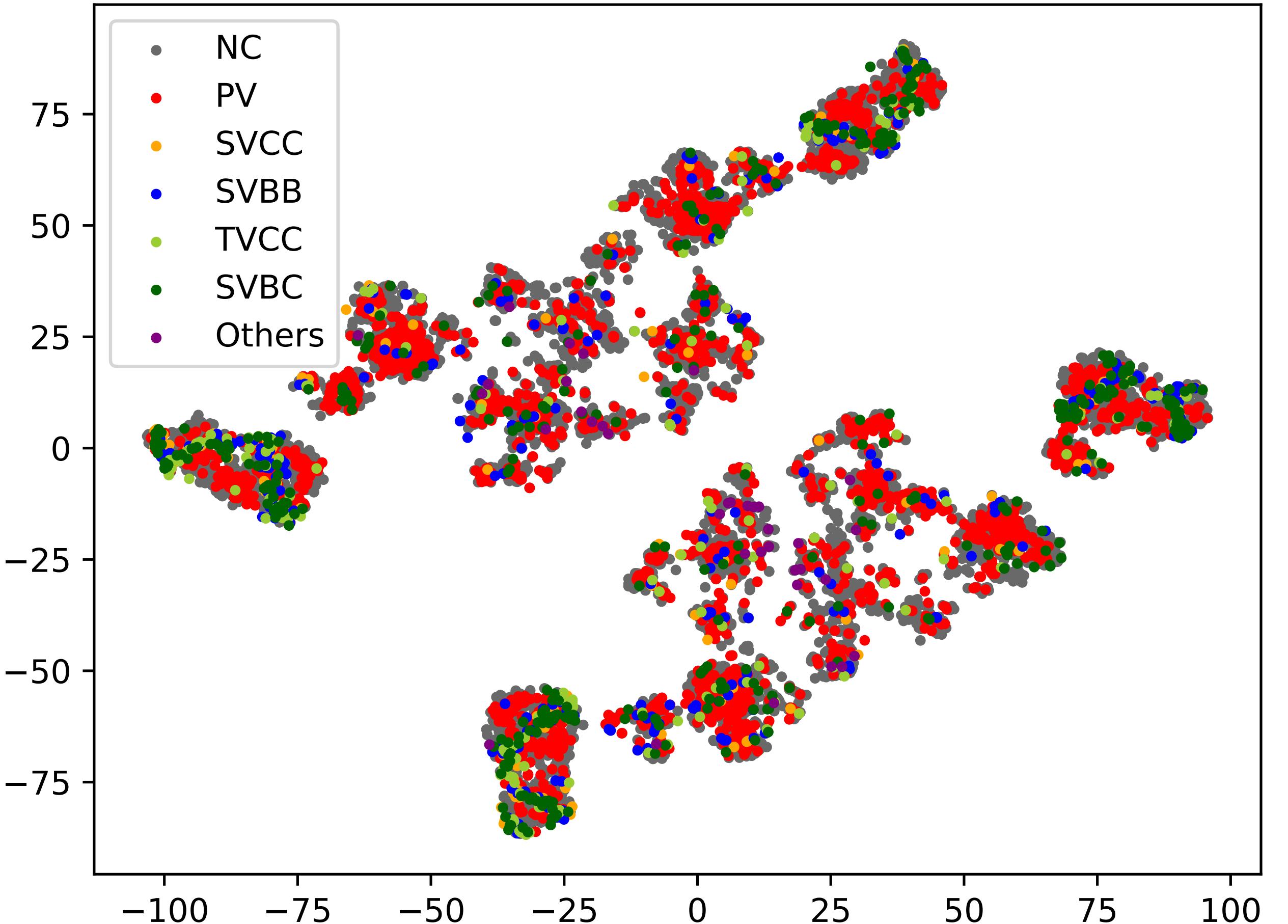
Others ROC Curve



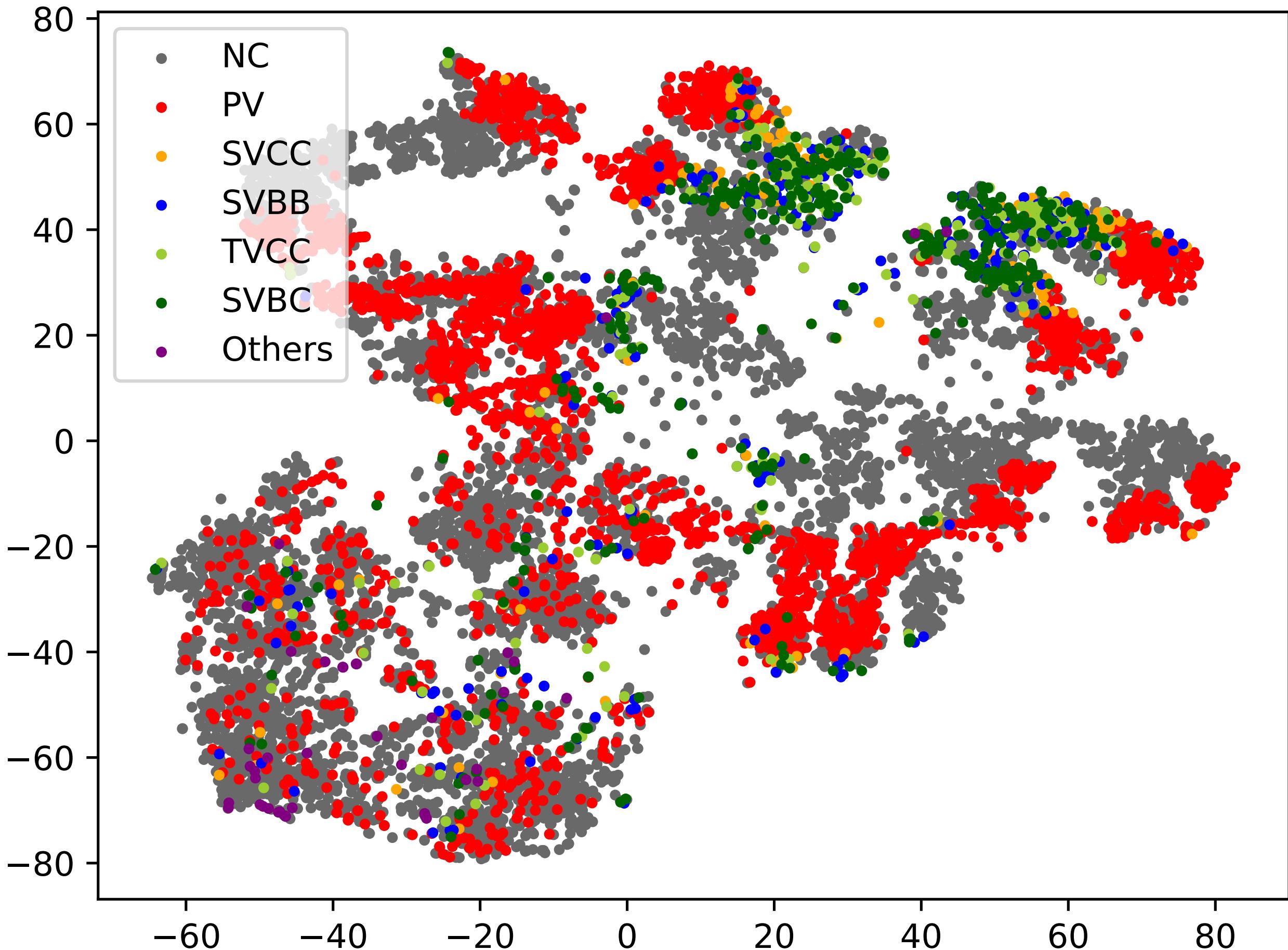


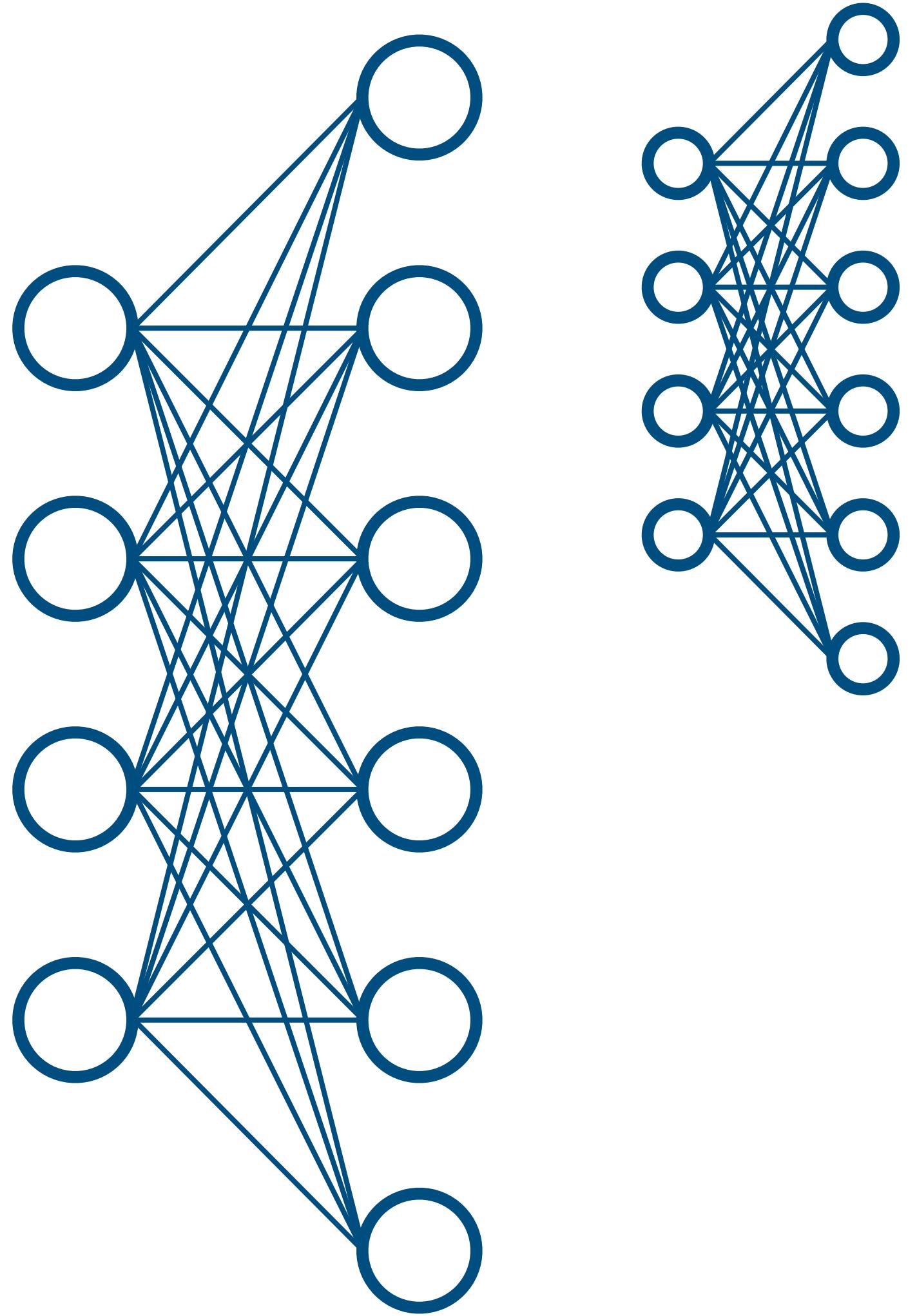


入力変数

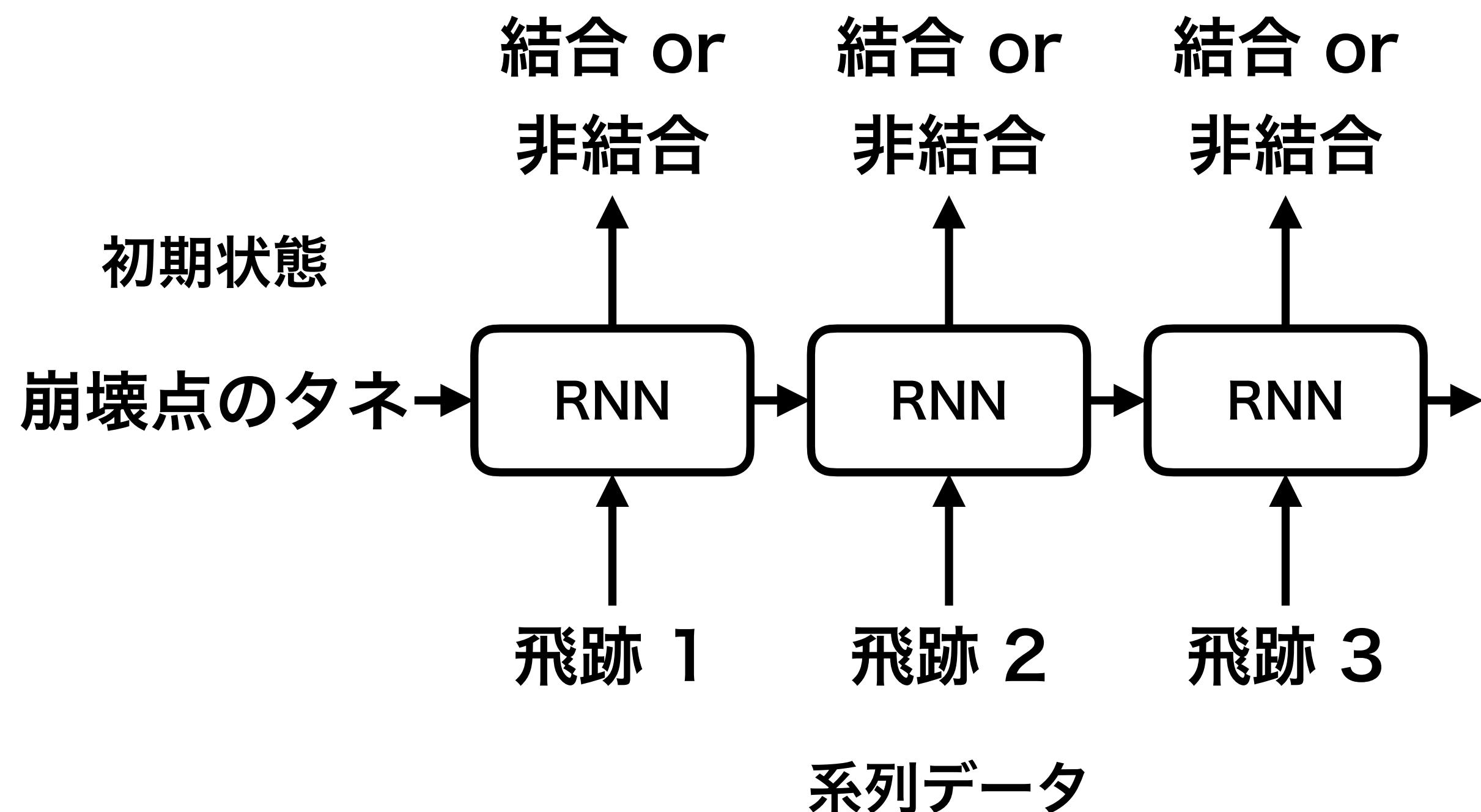


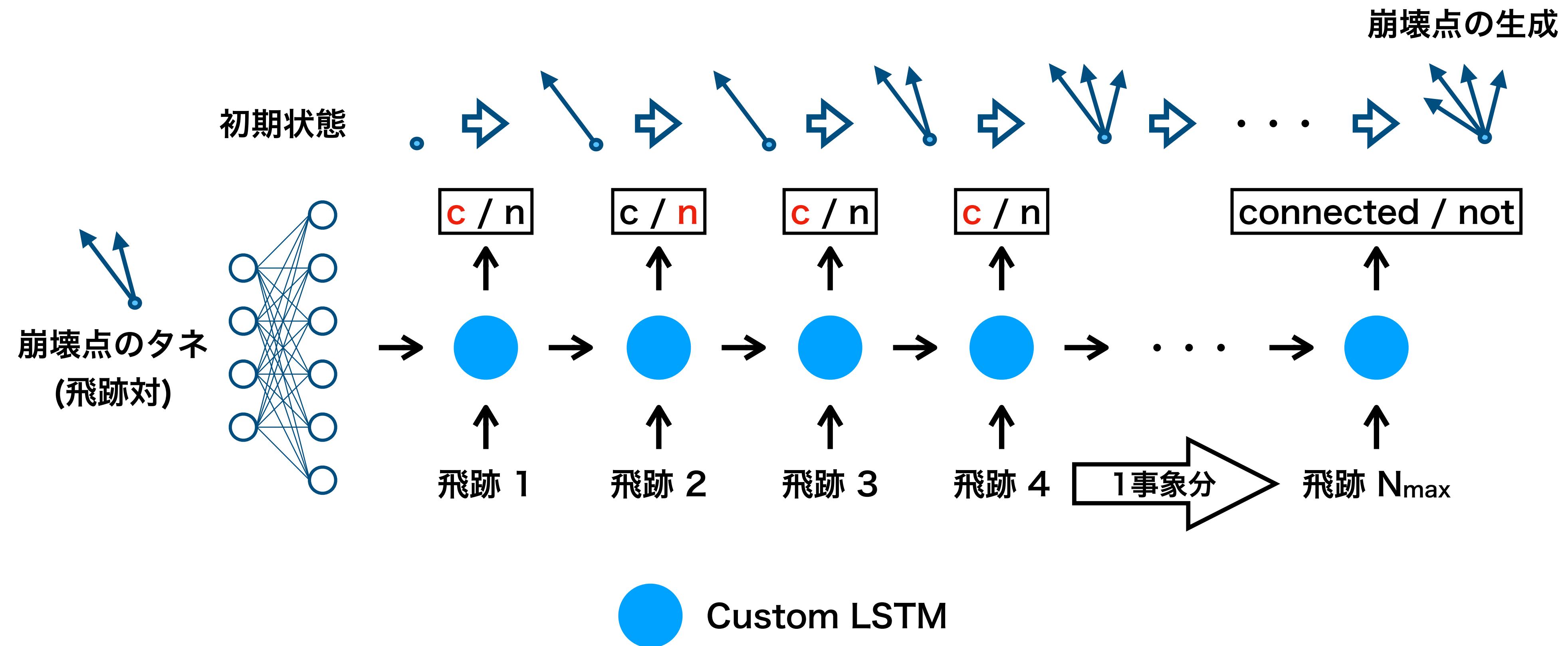
出力の直前の全結合層

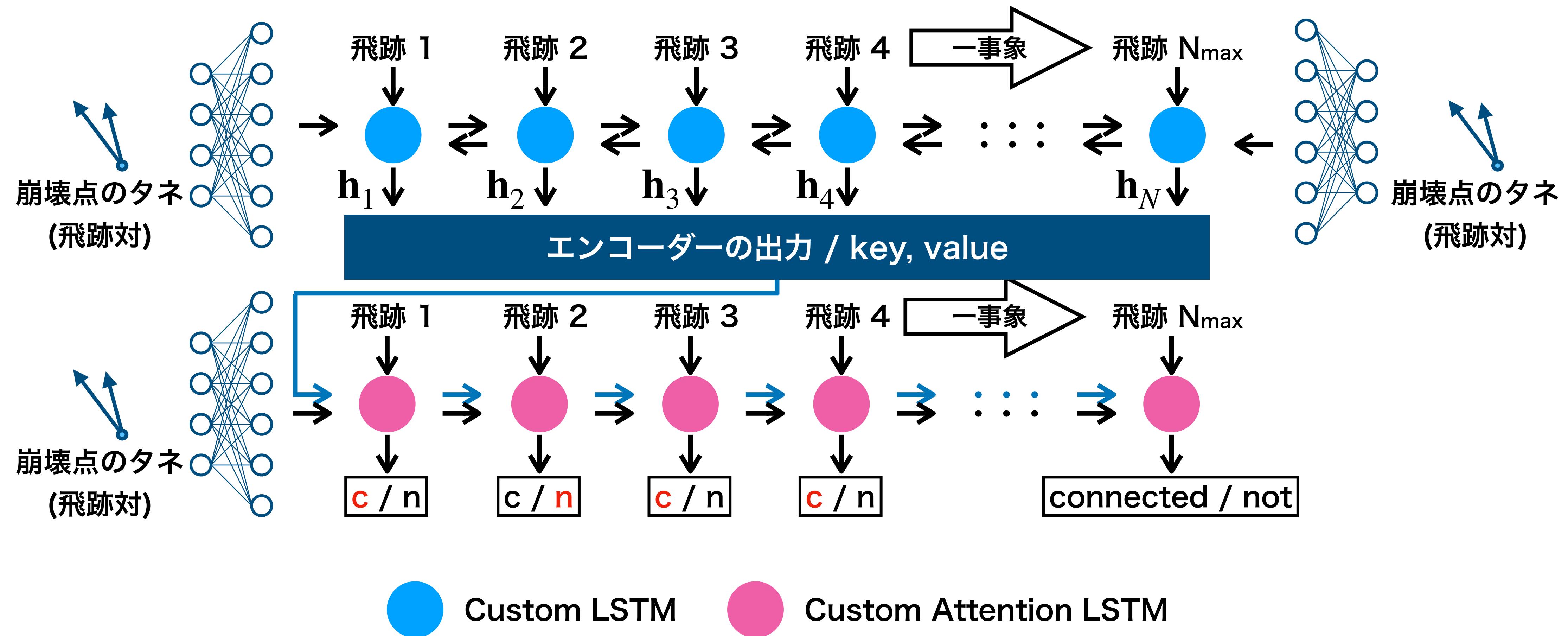




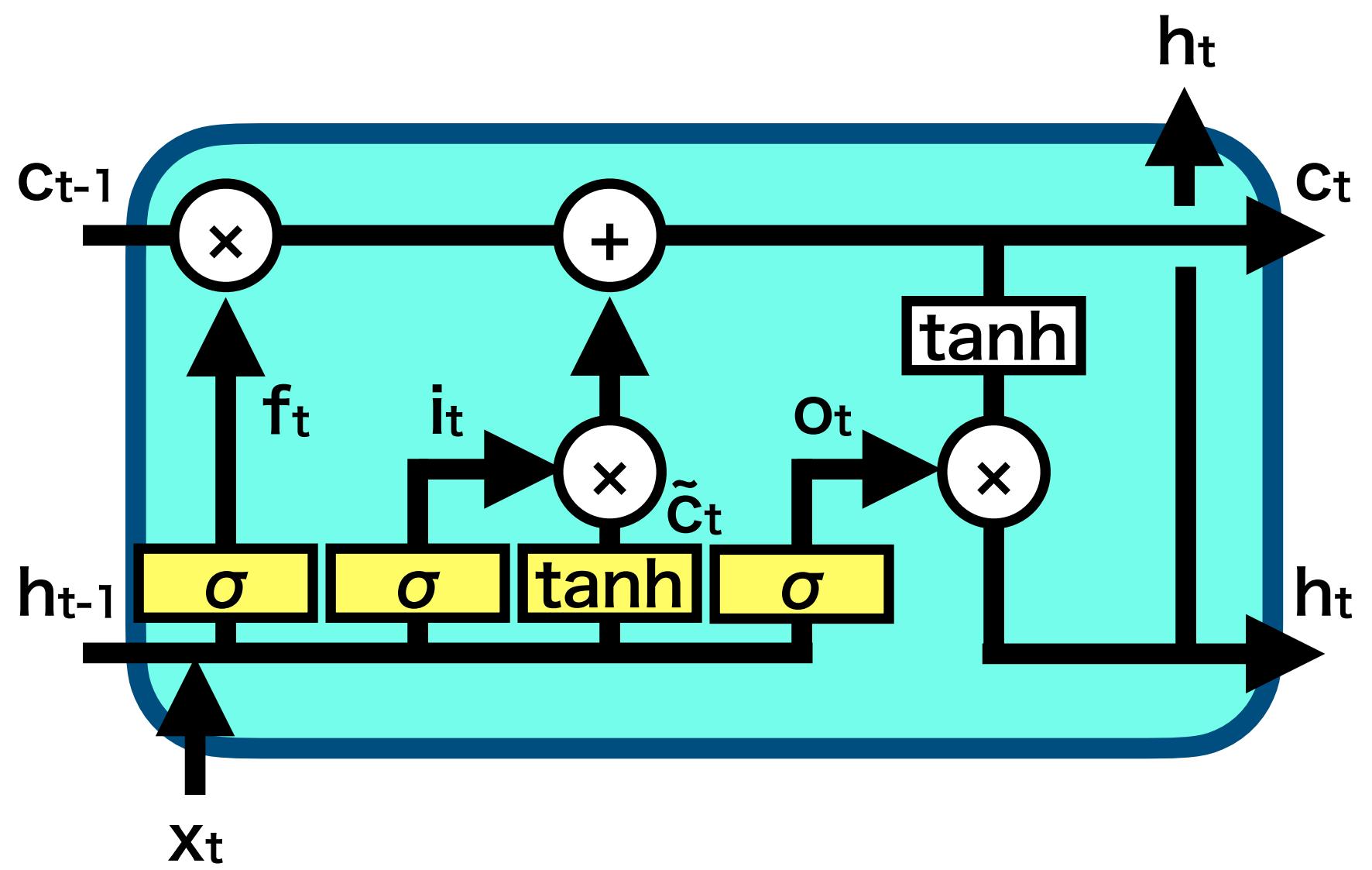
Many to Many



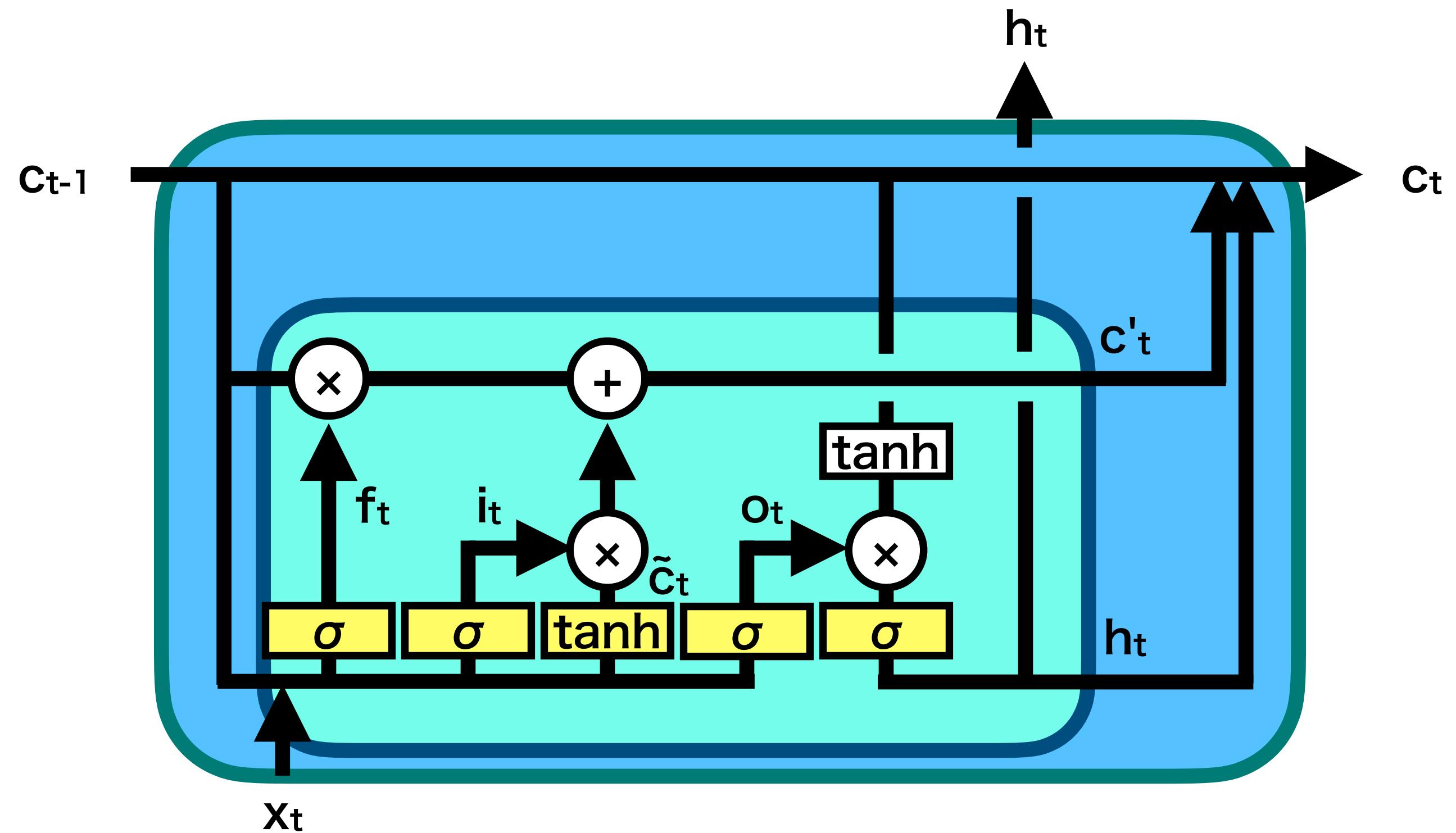


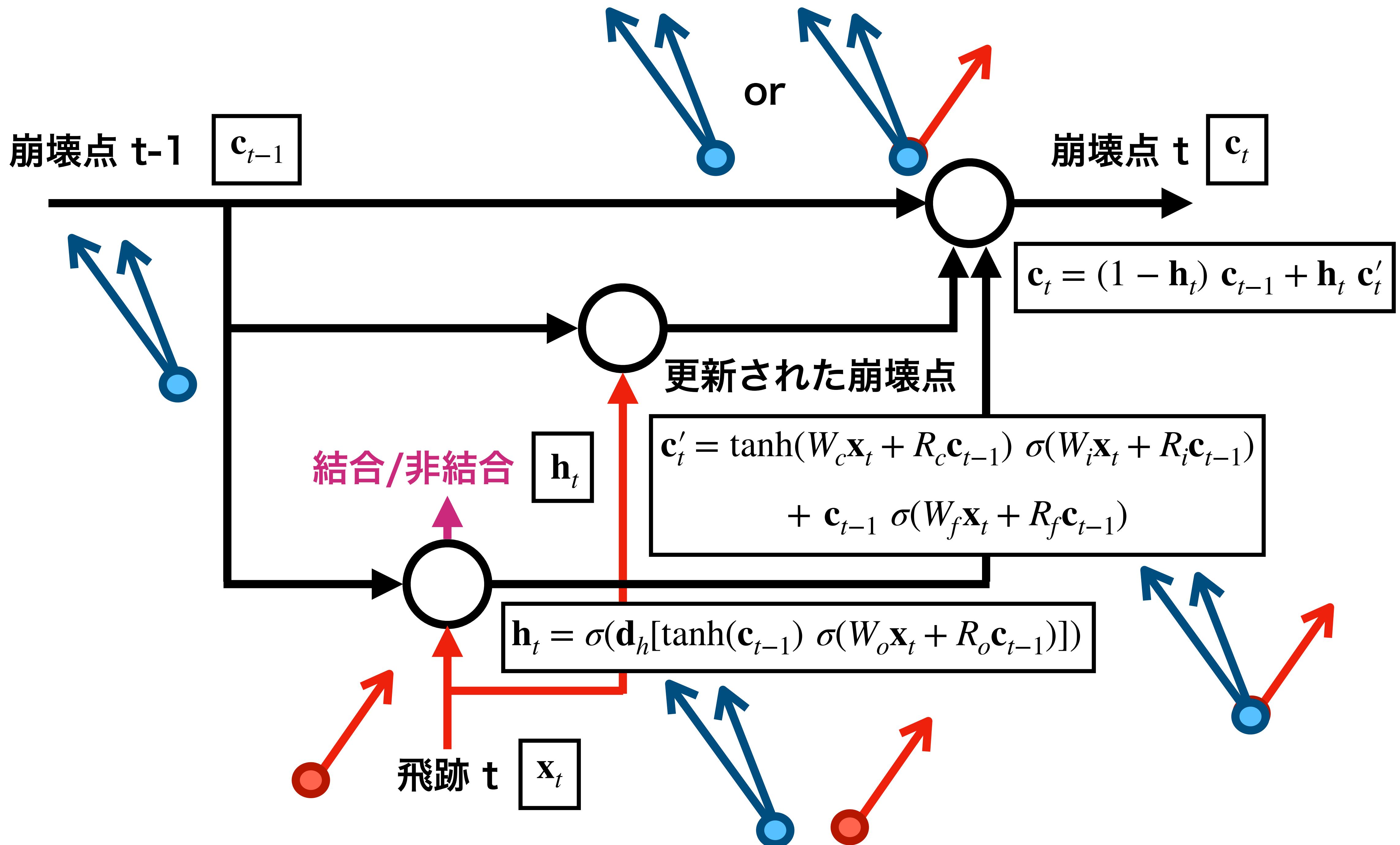


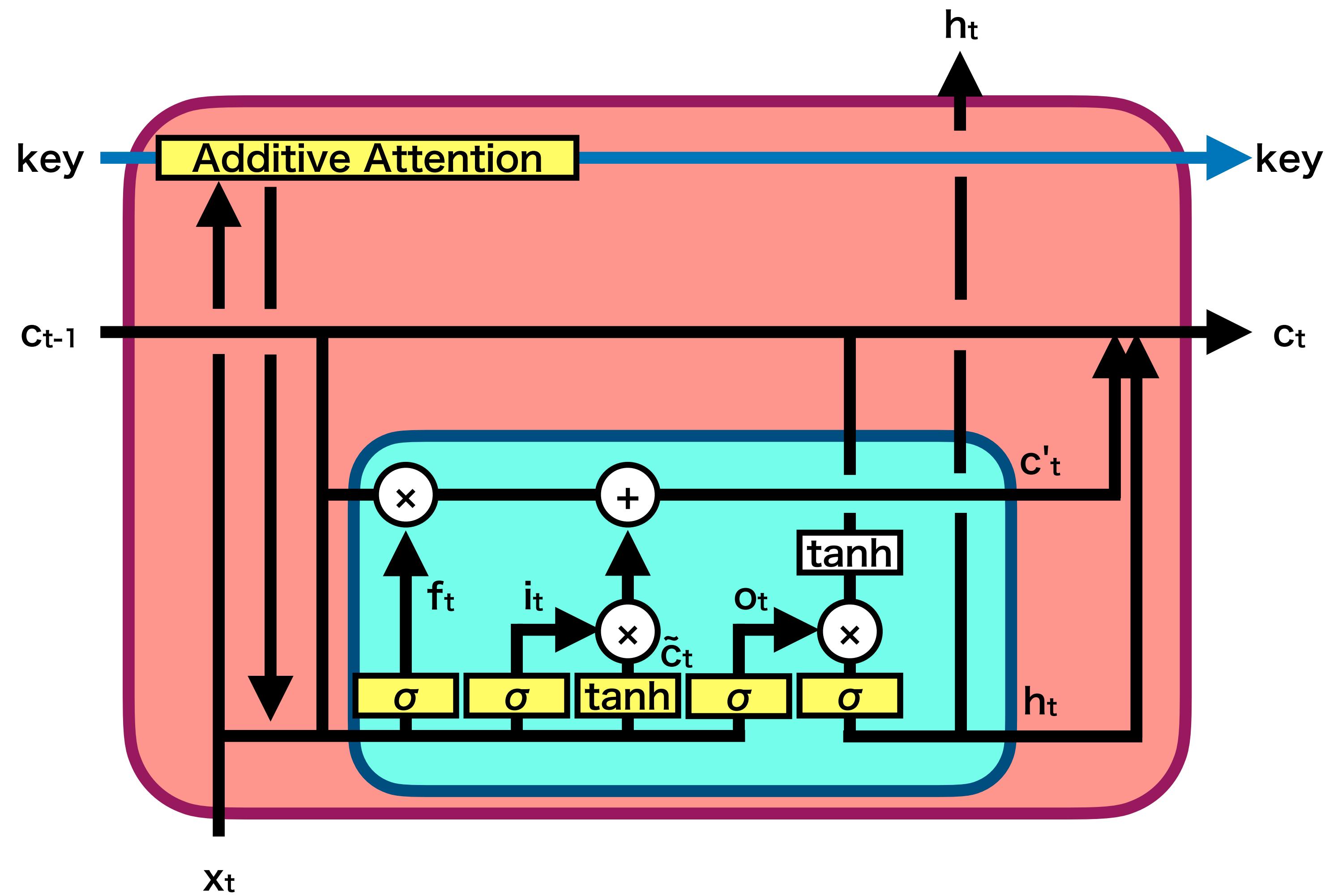
LSTM

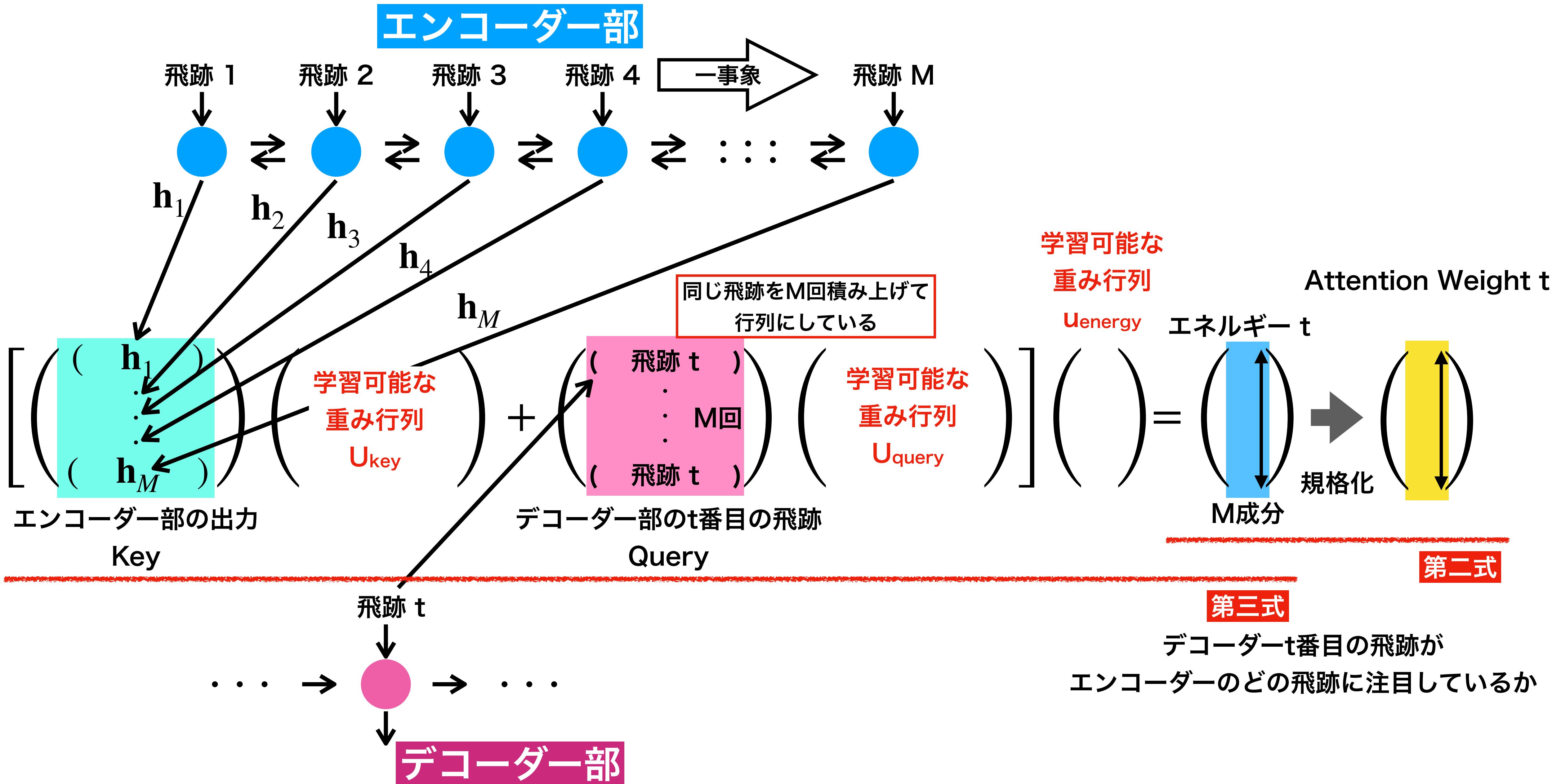


崩壊点生成のための リカレントニューラルネットワーク

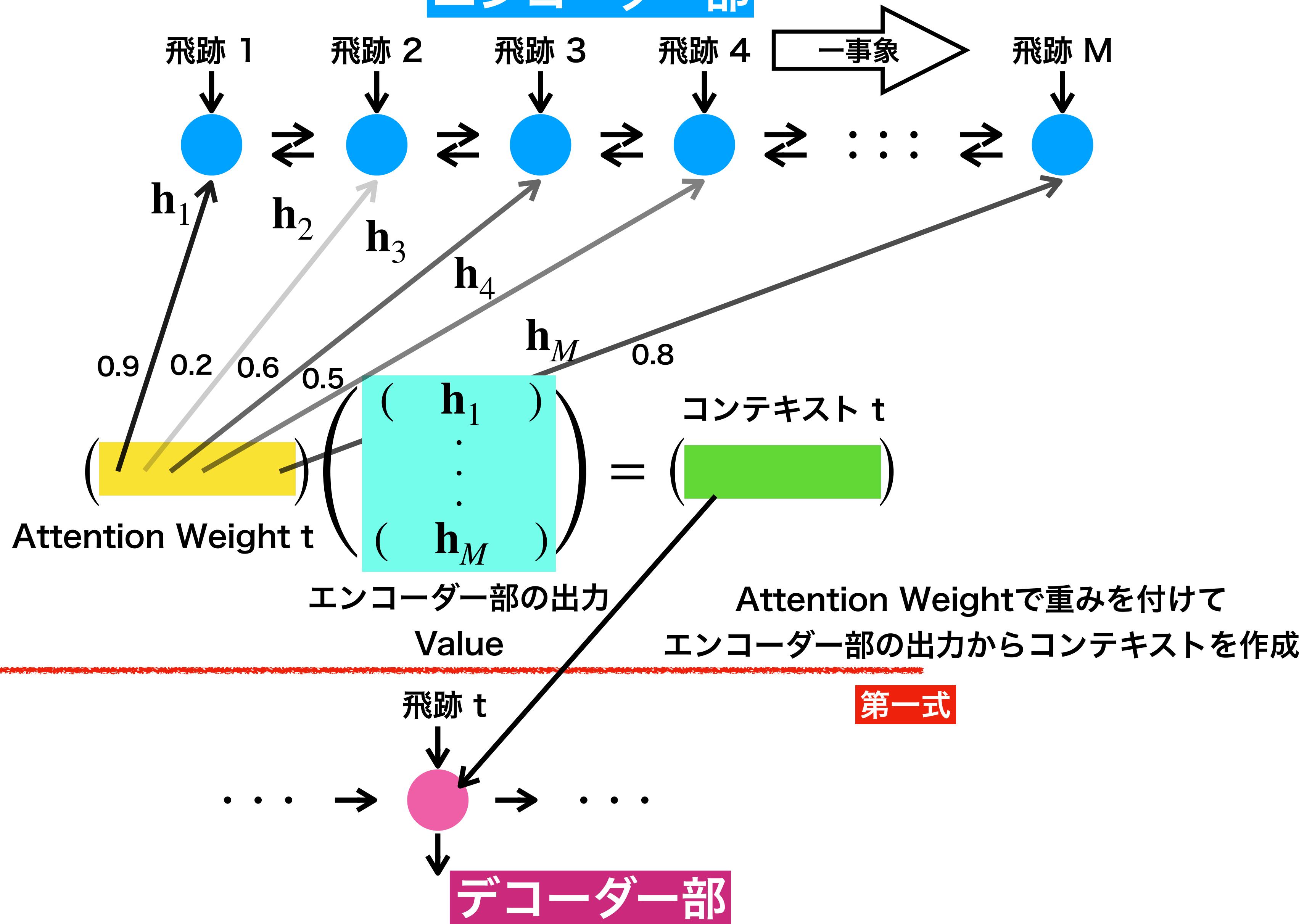


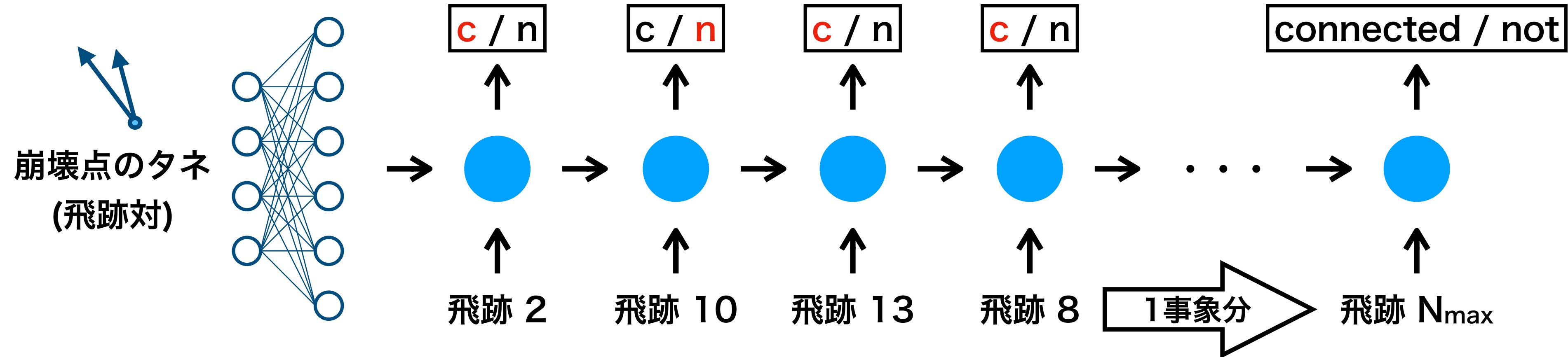
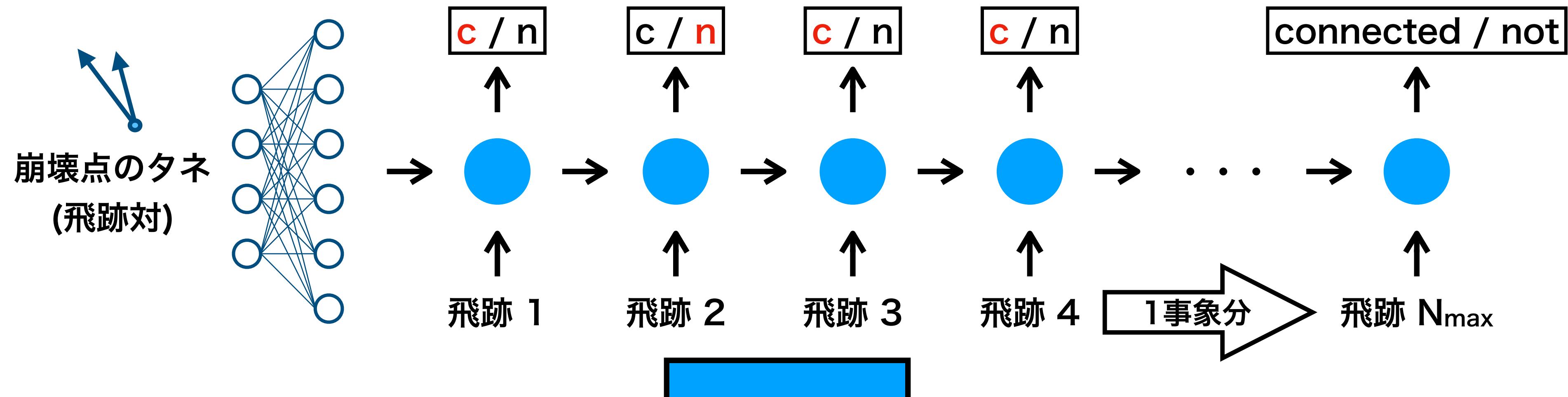




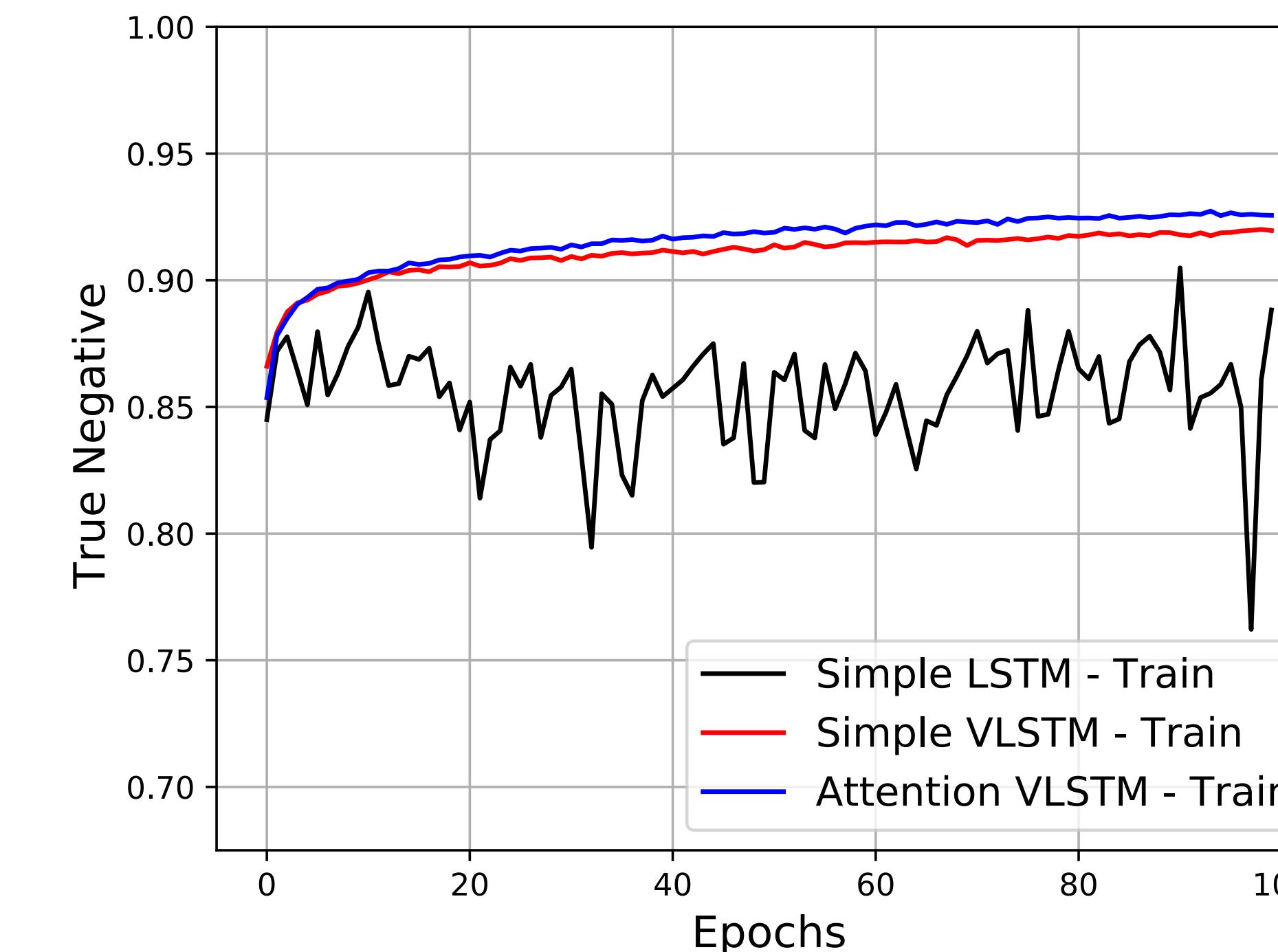
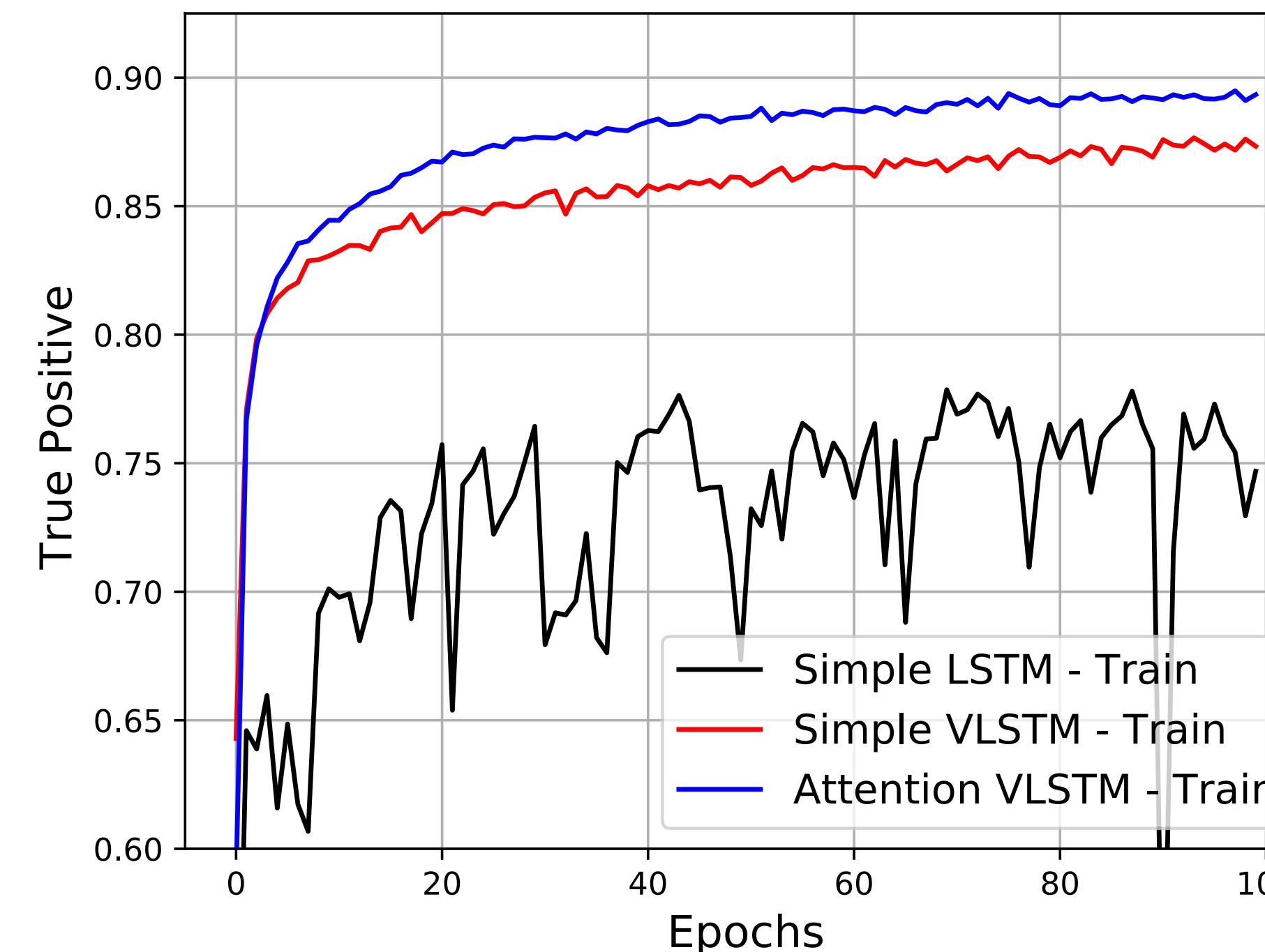
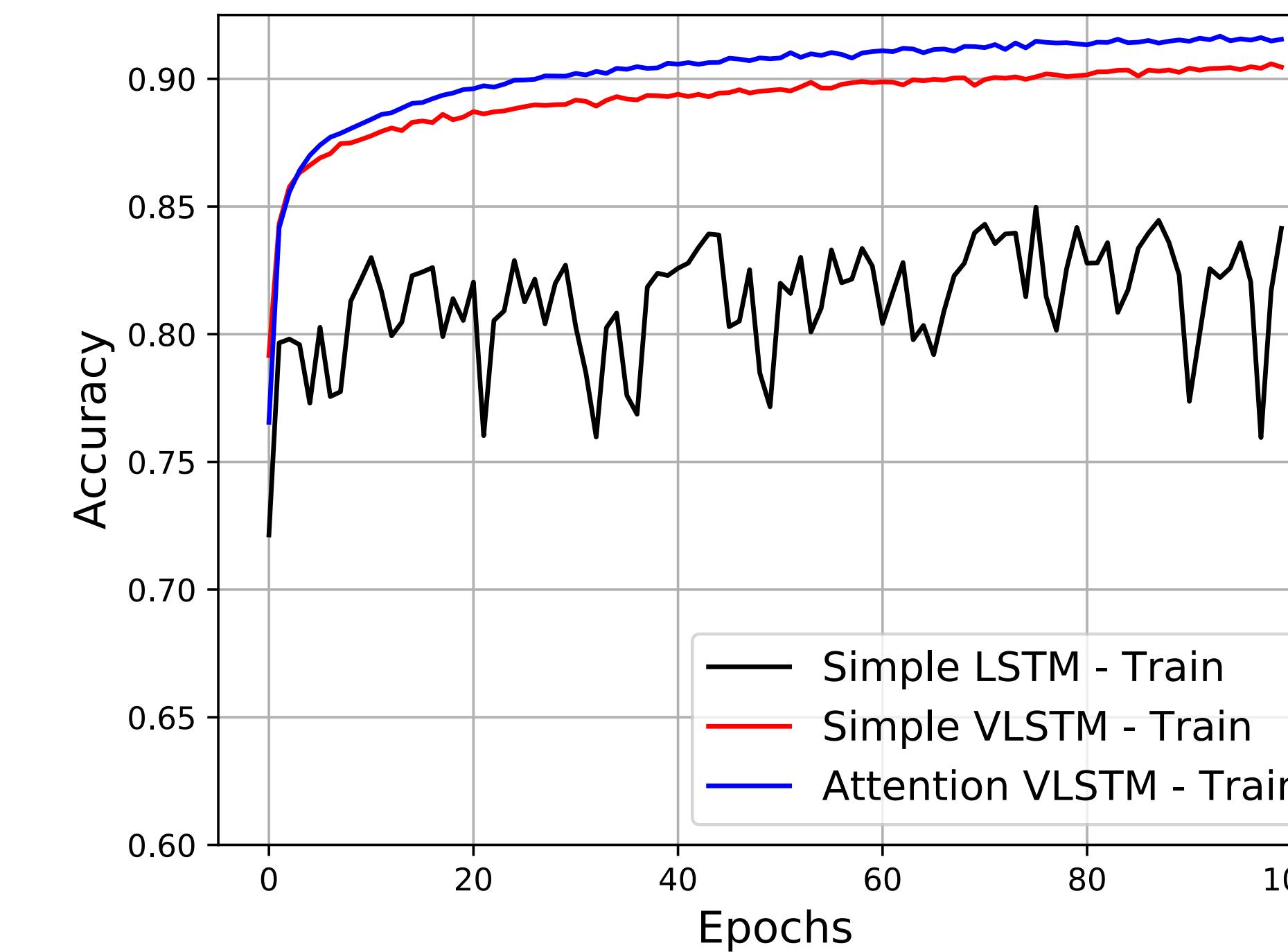
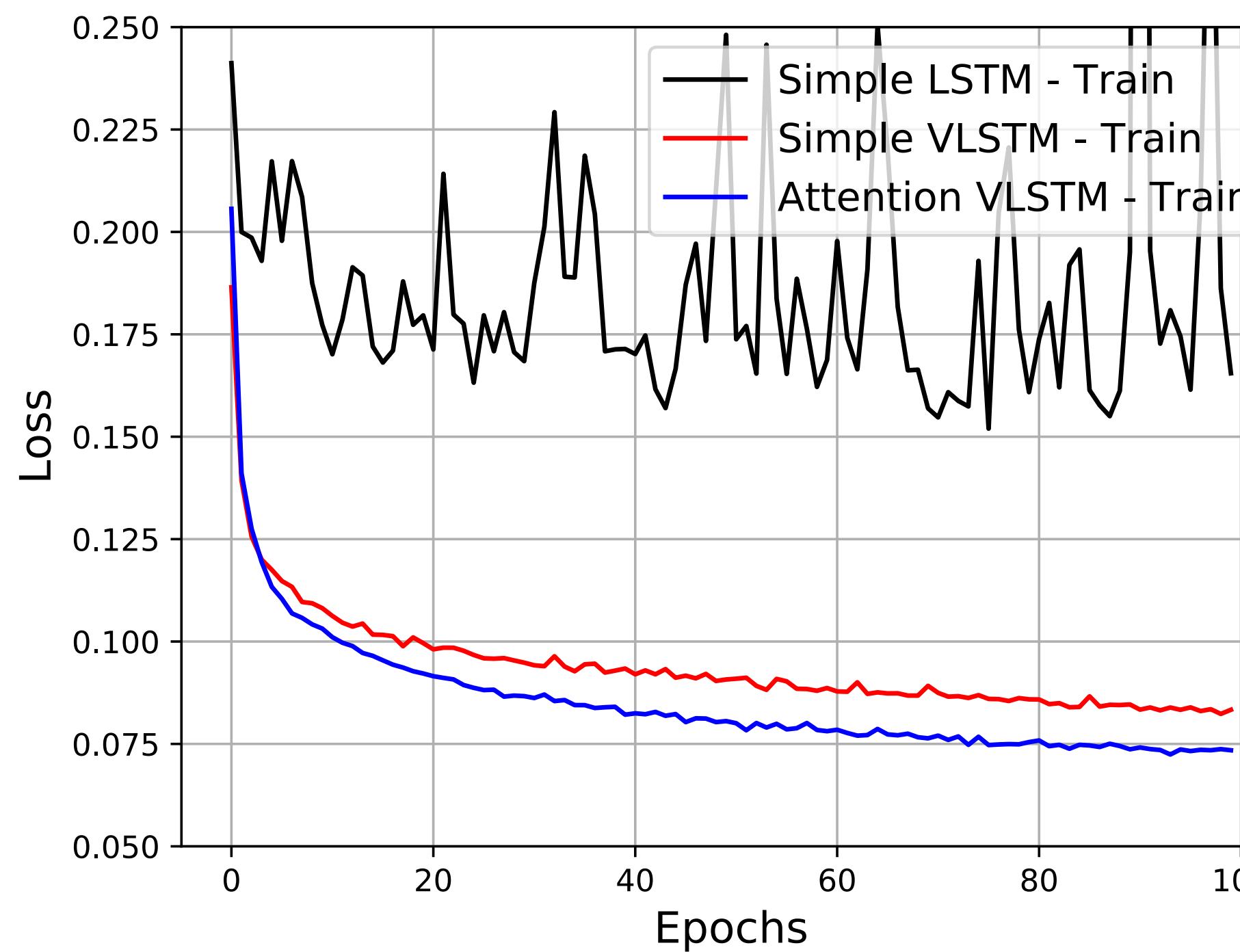


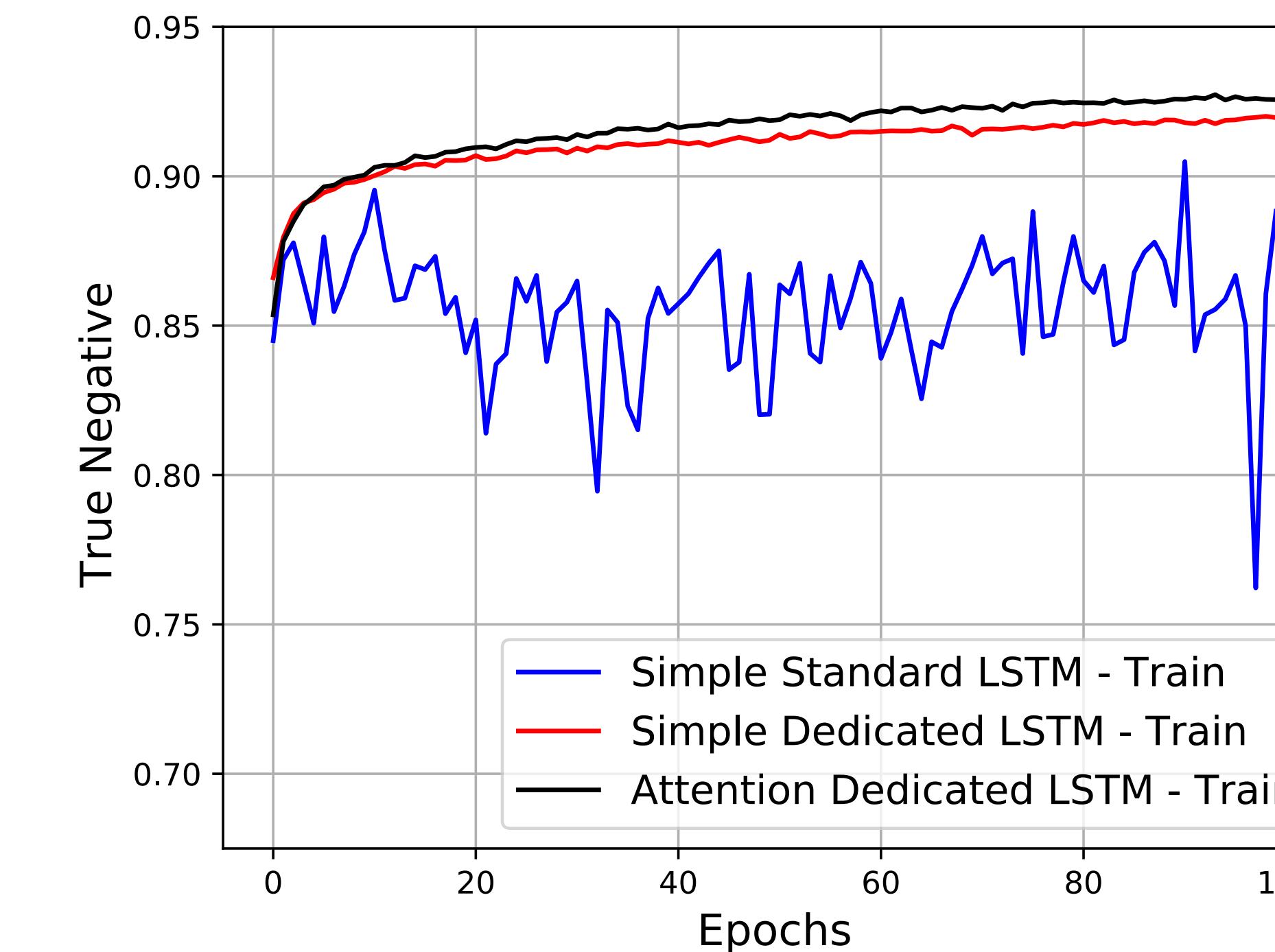
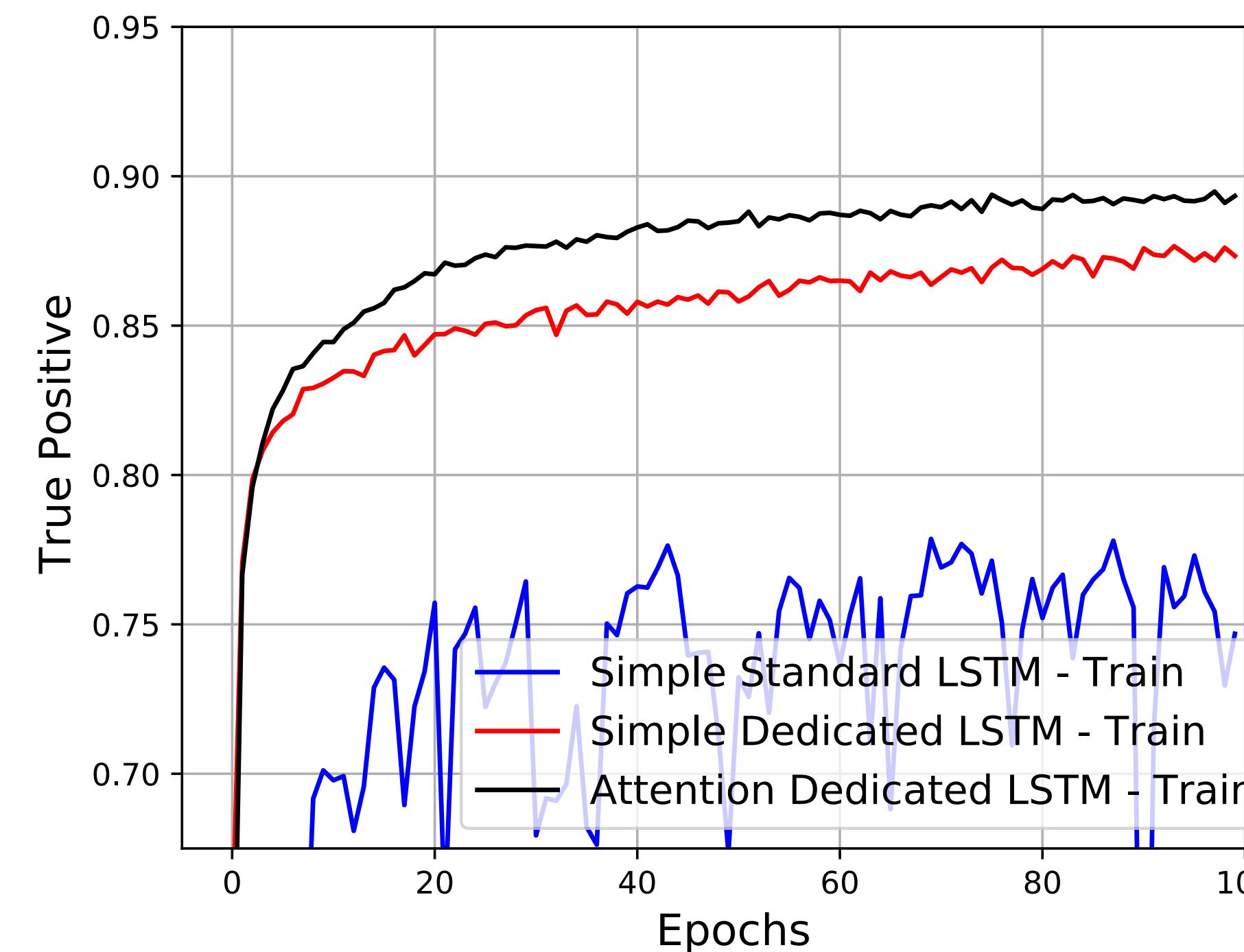
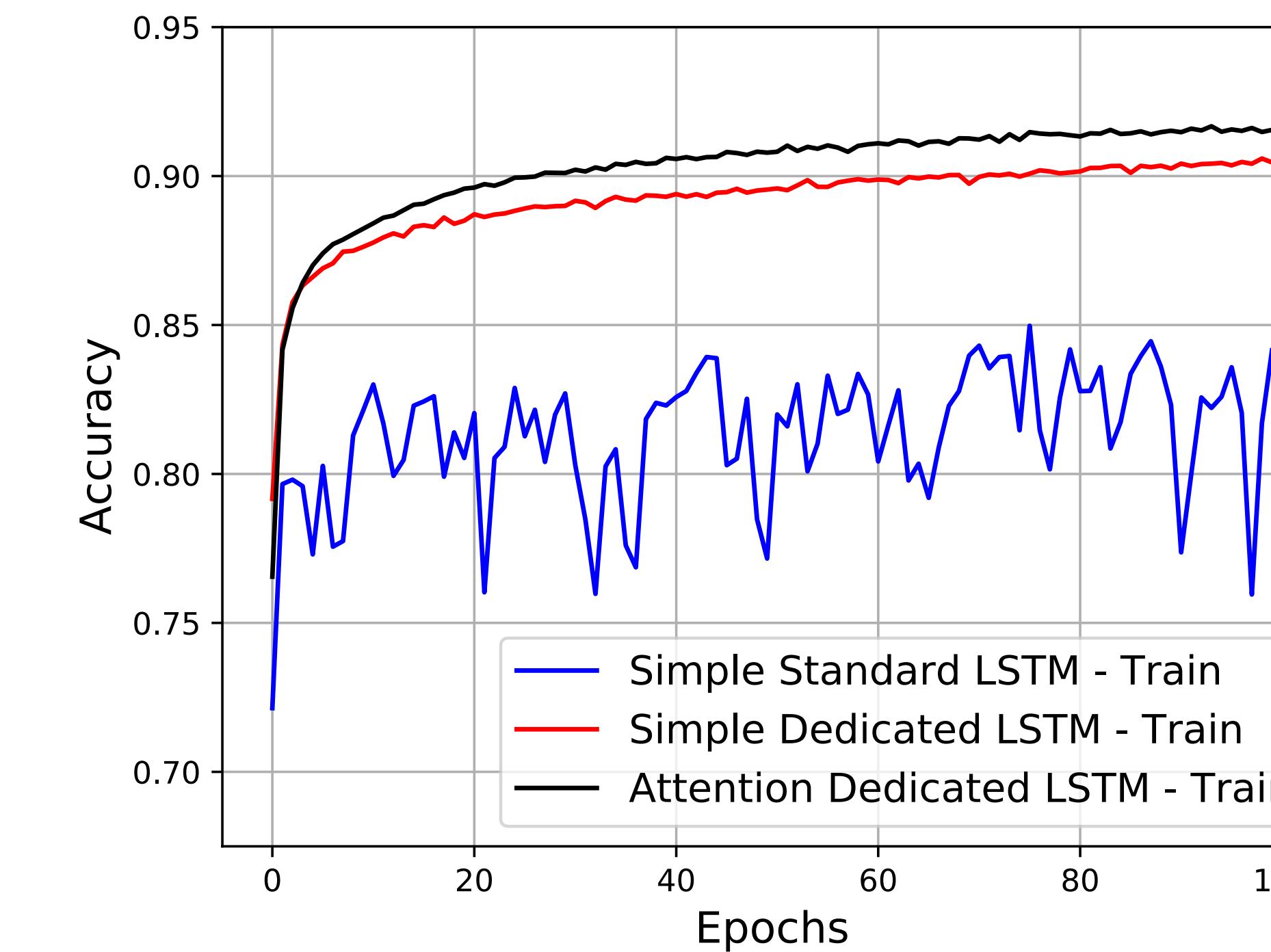
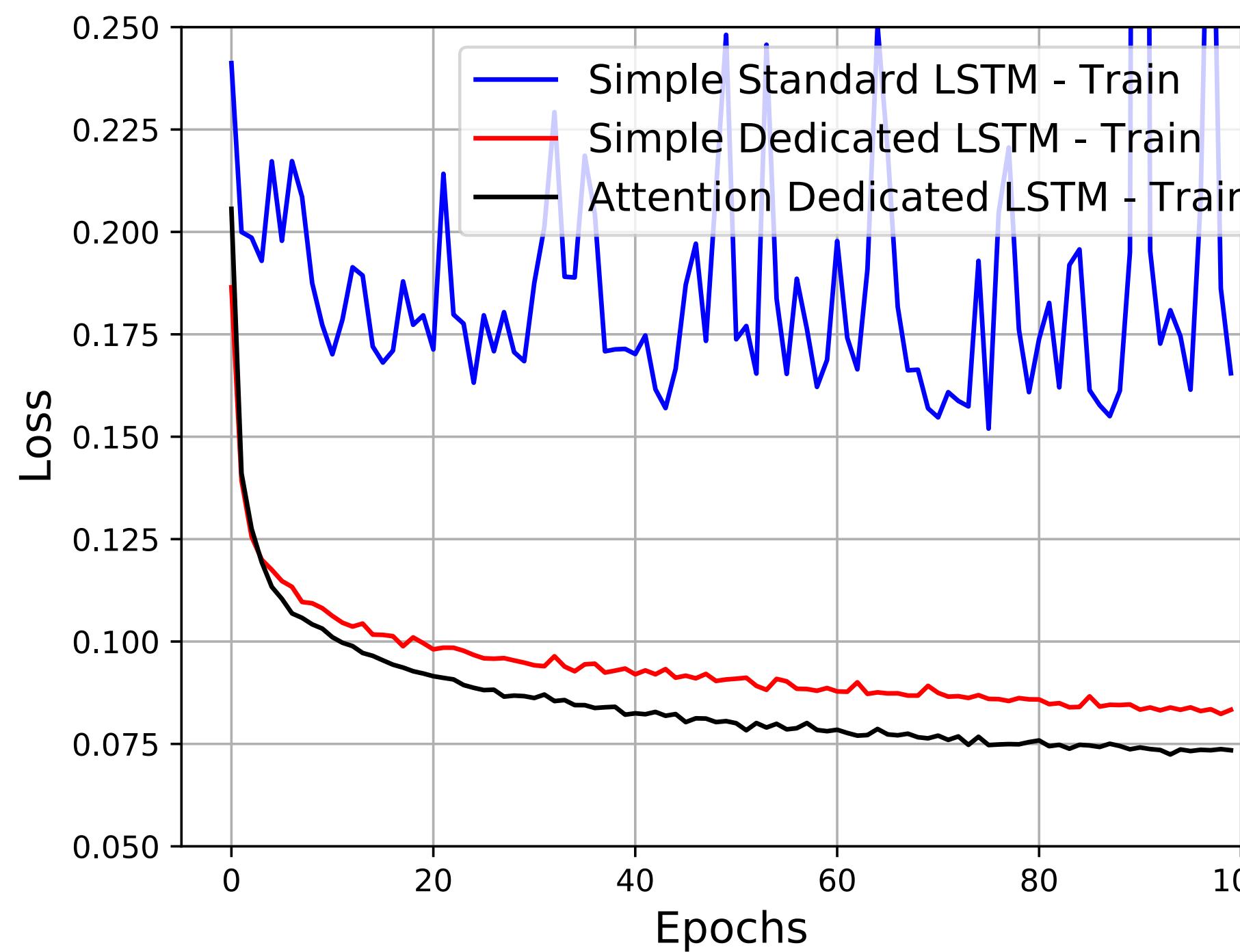
エンコーダー部

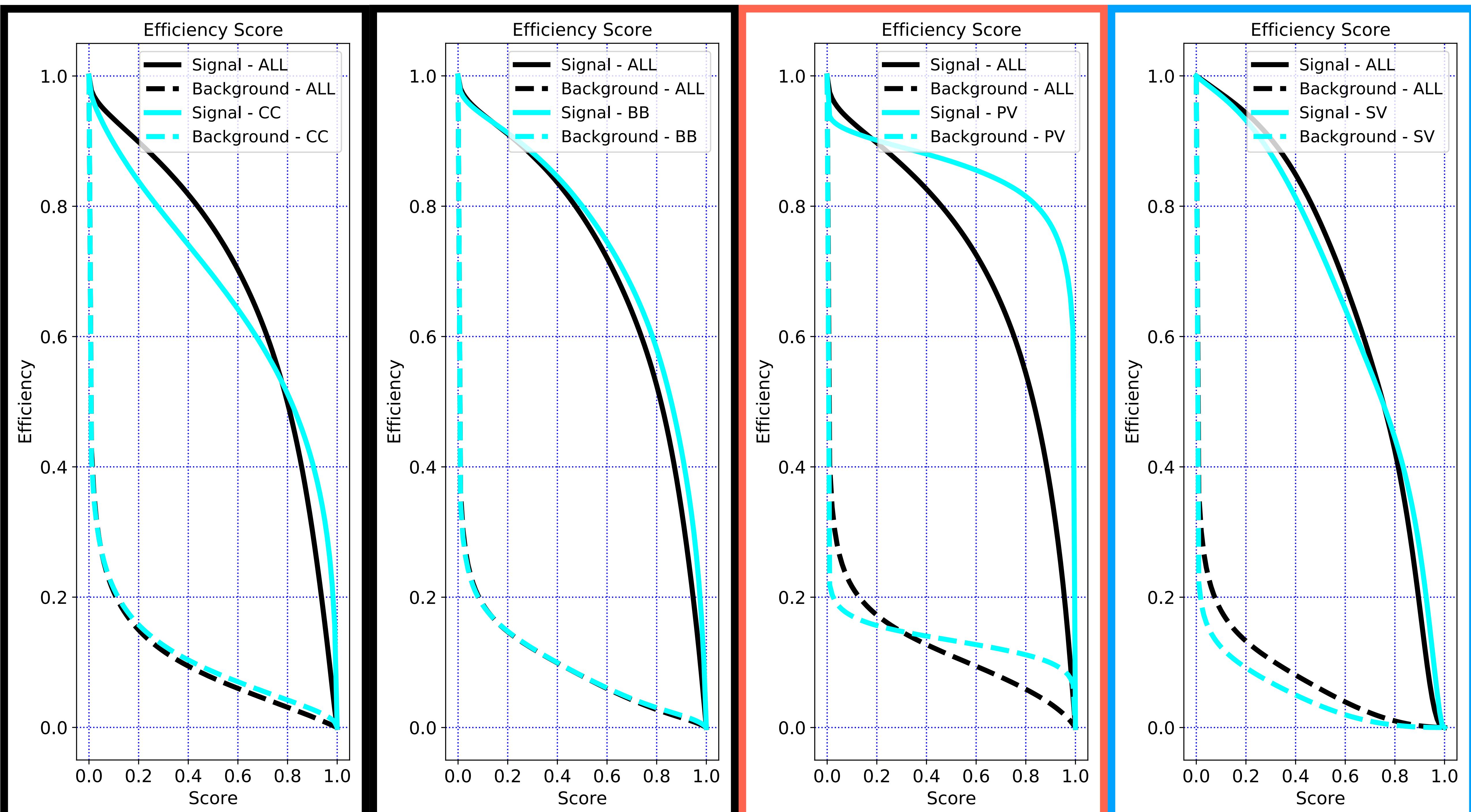


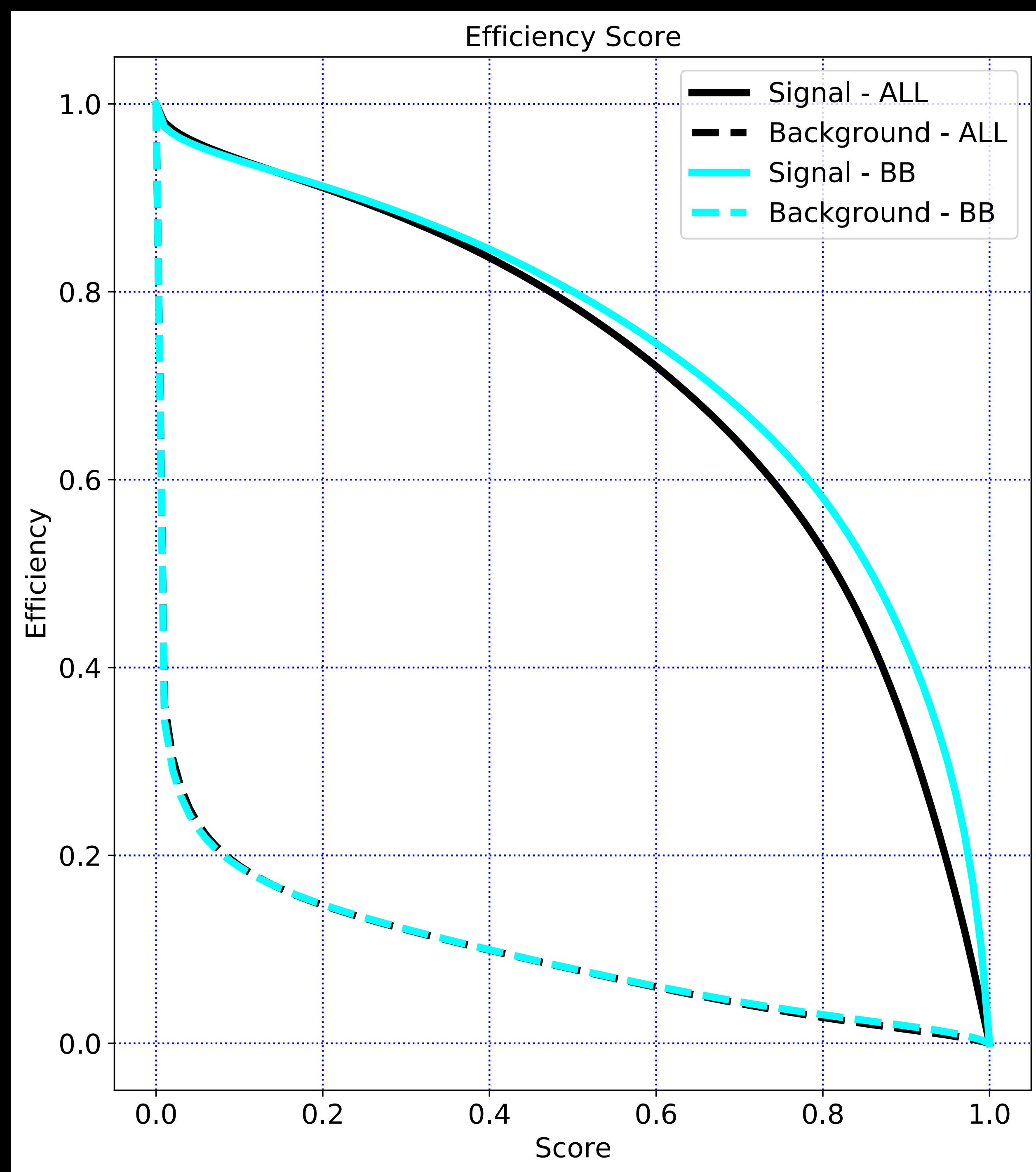
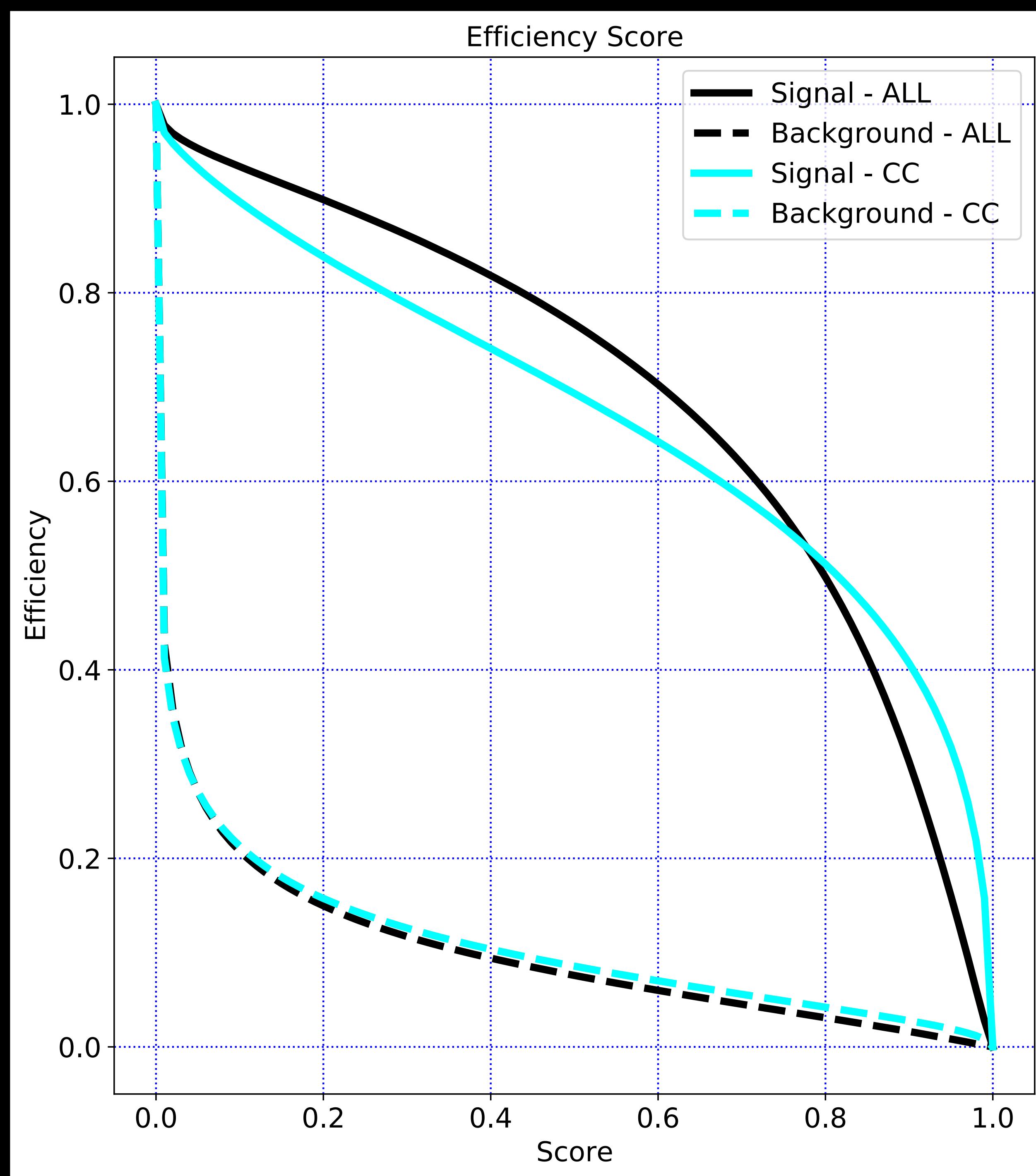


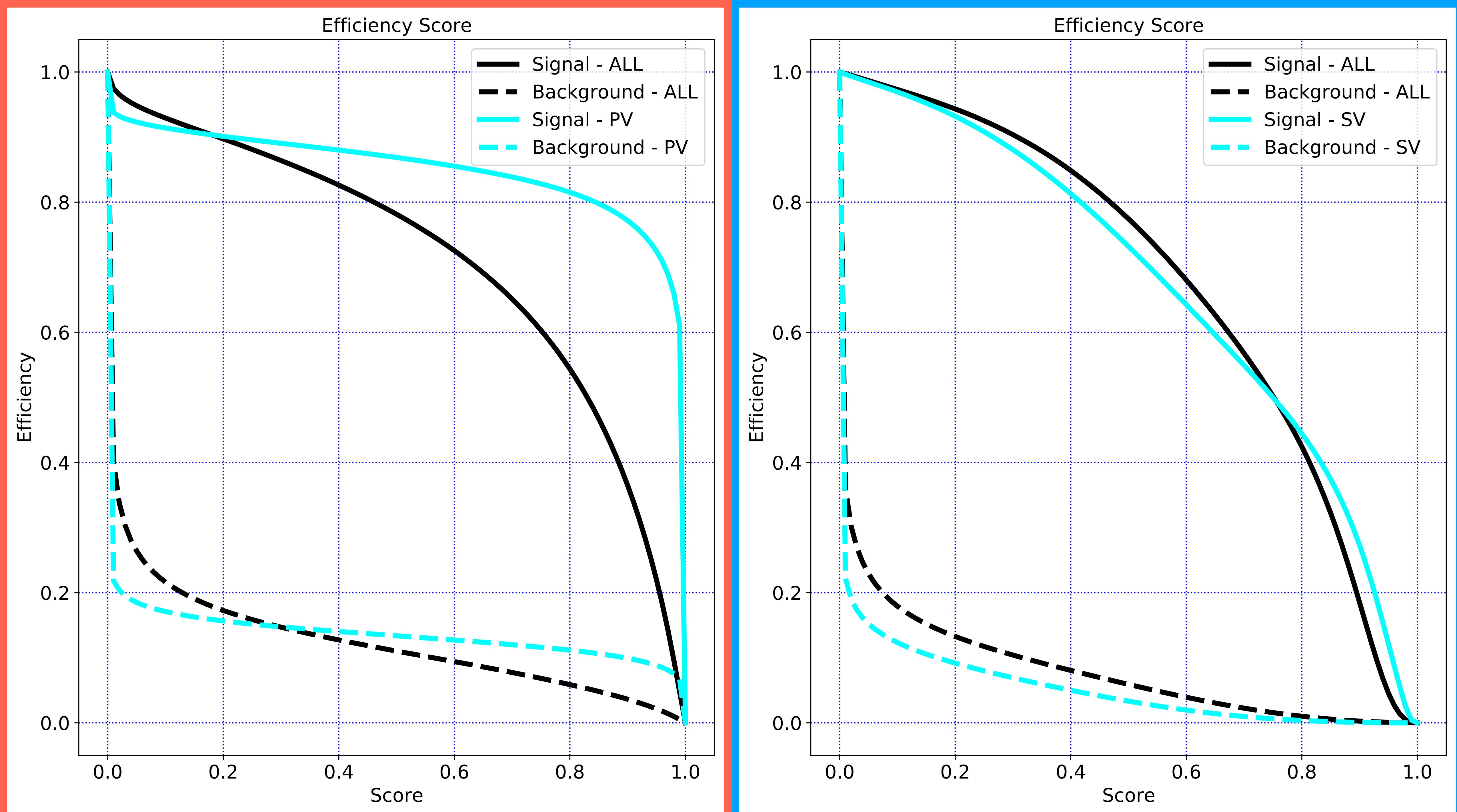
飛跡順のシャッフル

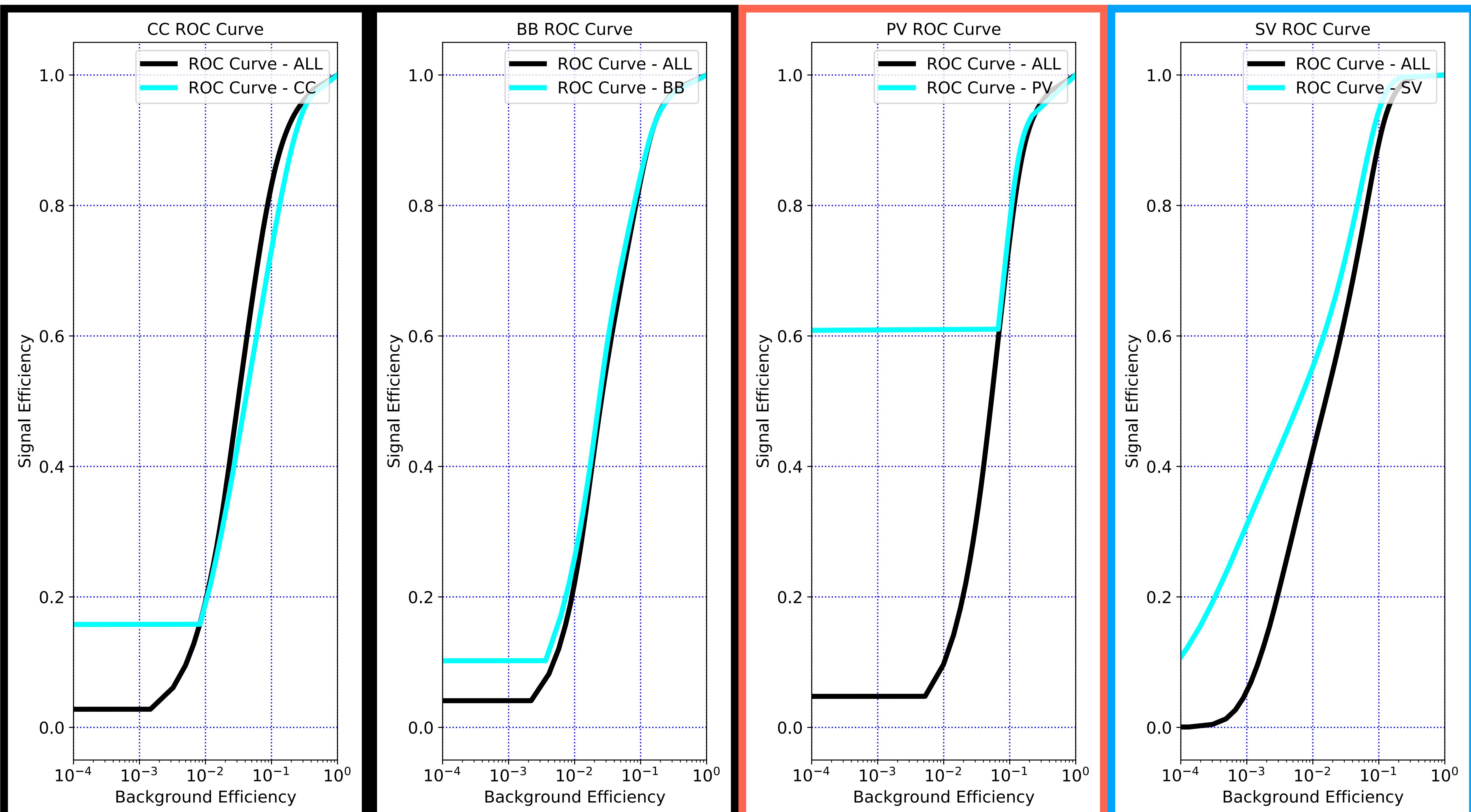




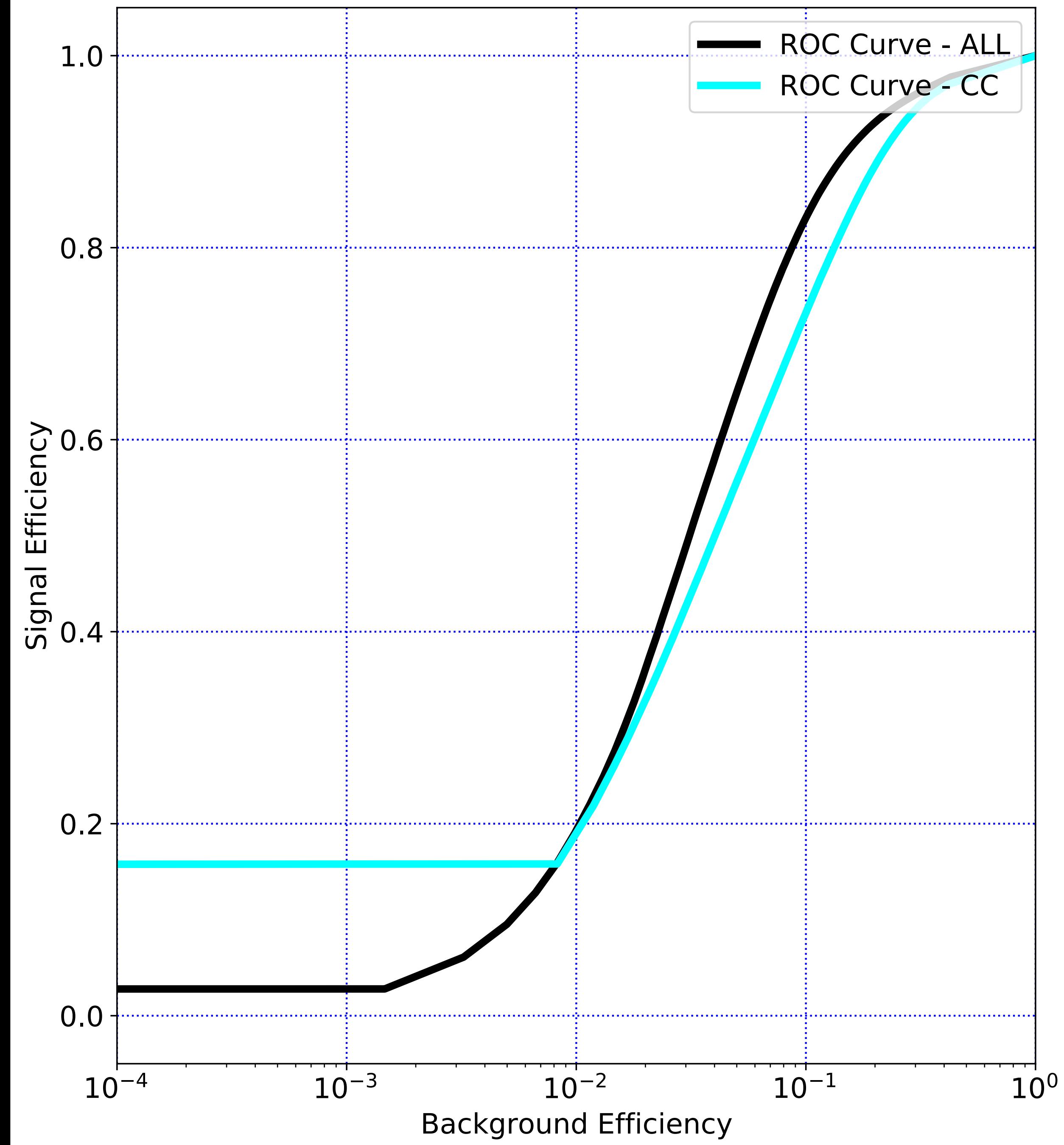




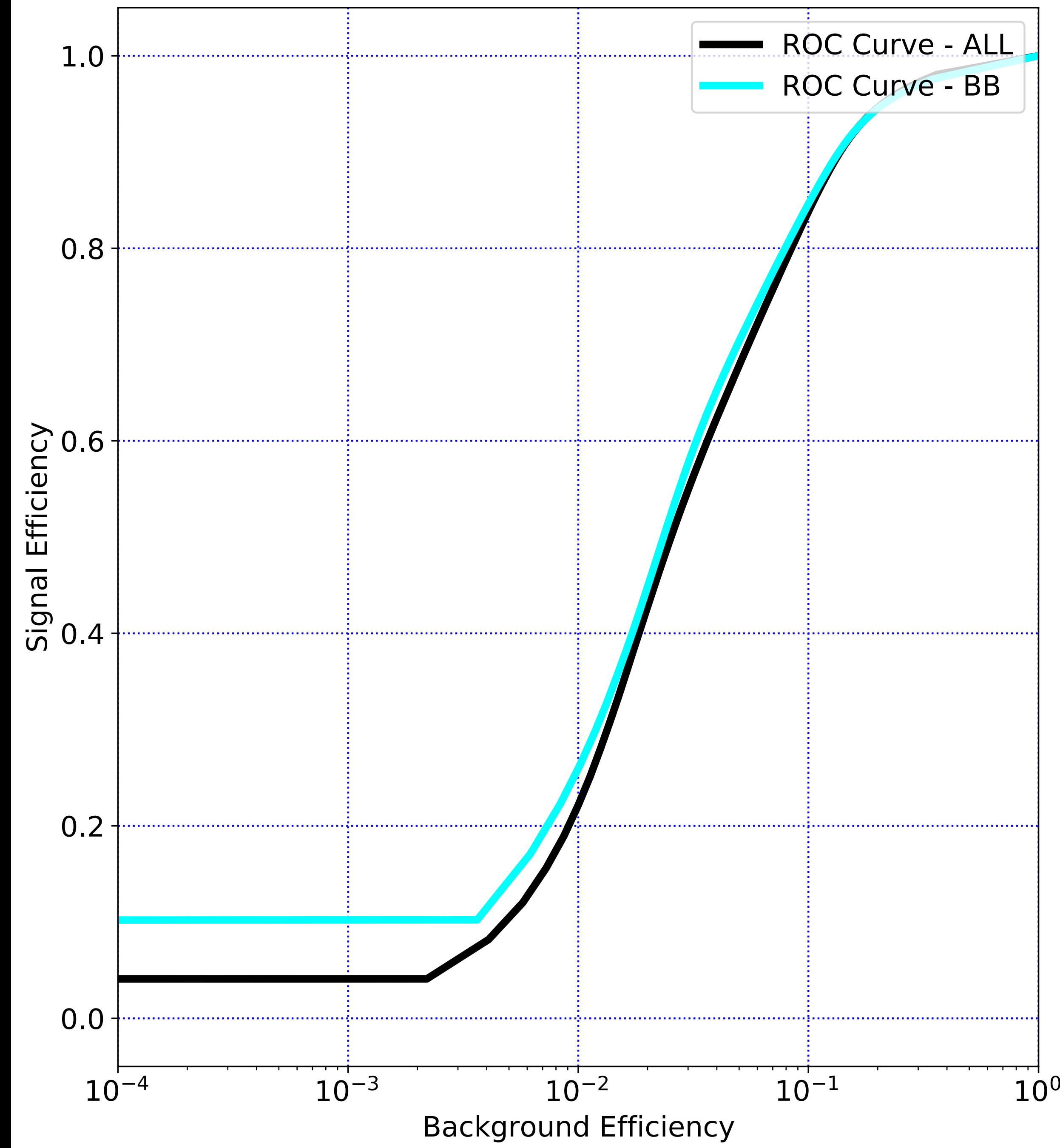




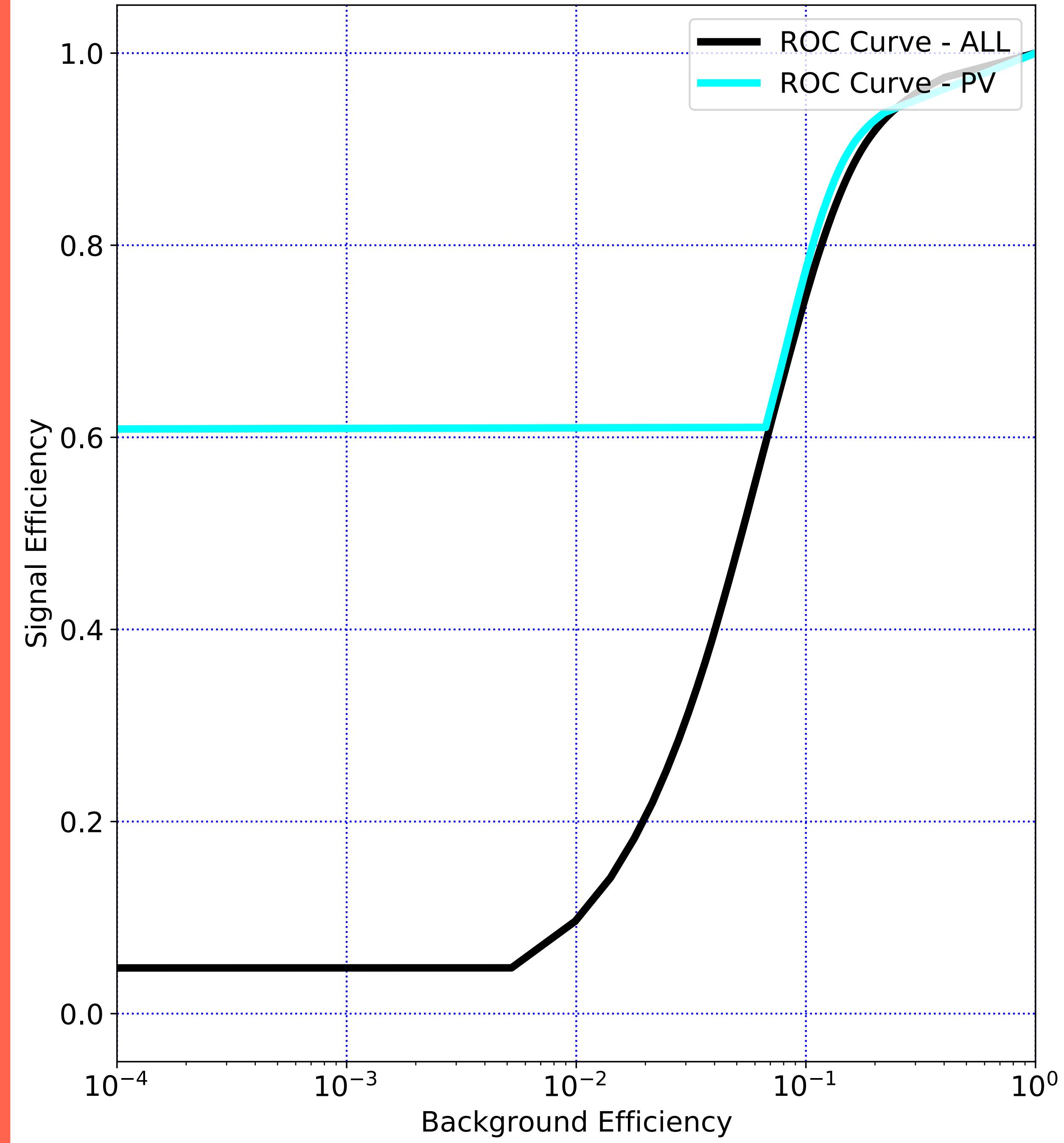
CC ROC Curve



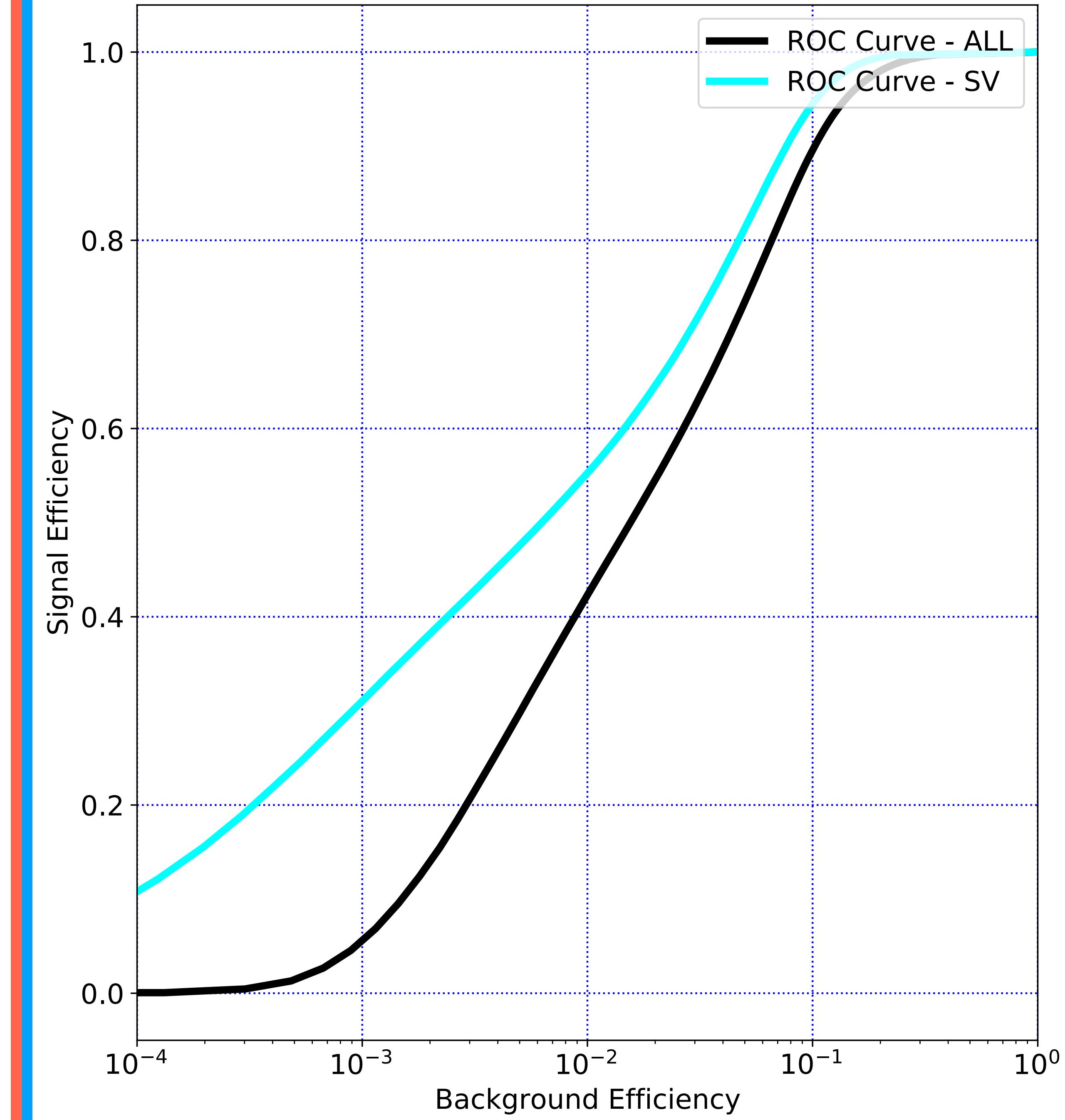
BB ROC Curve



PV ROC Curve



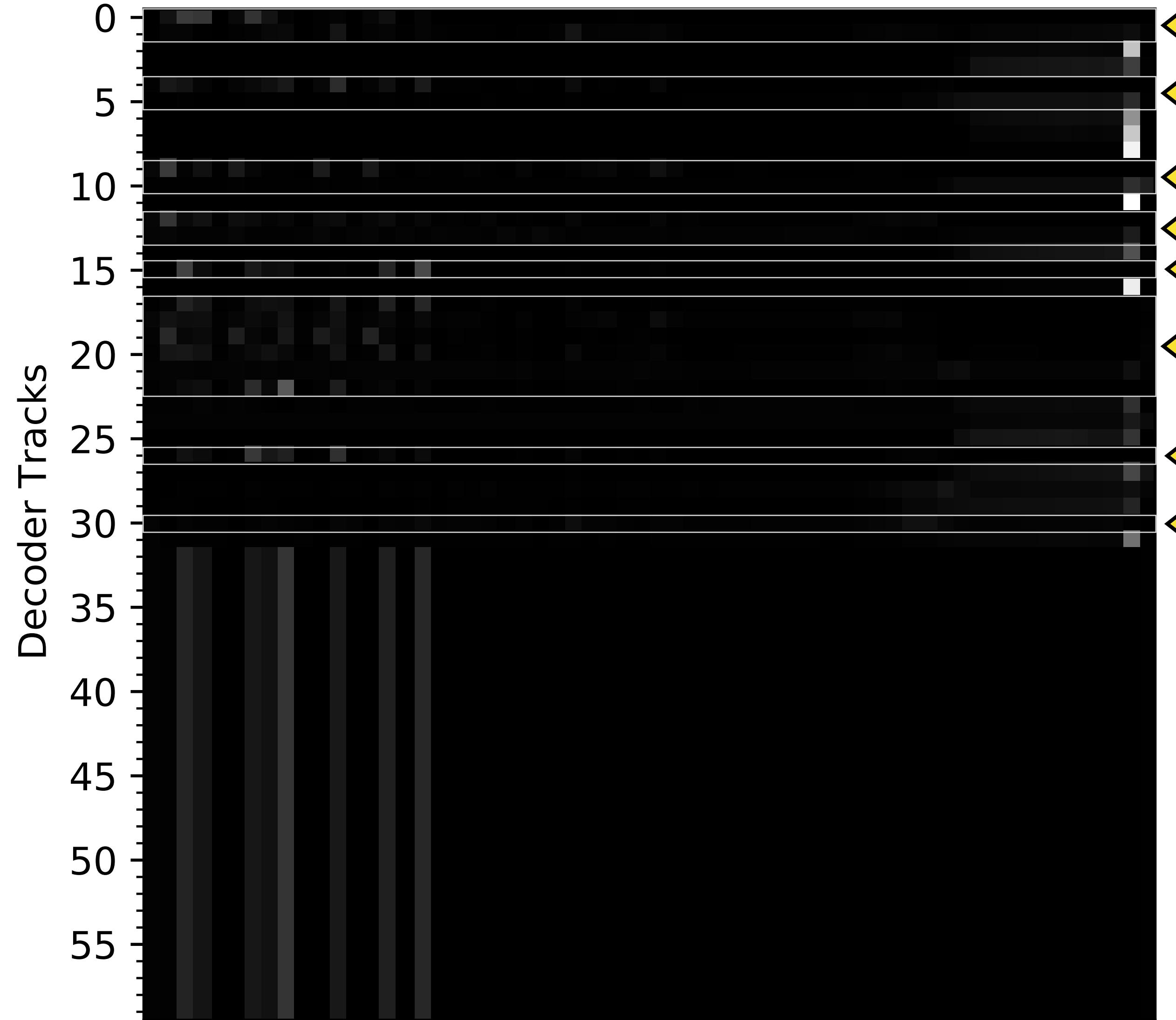
SV ROC Curve



Attention Weight Map

Connected tracks are

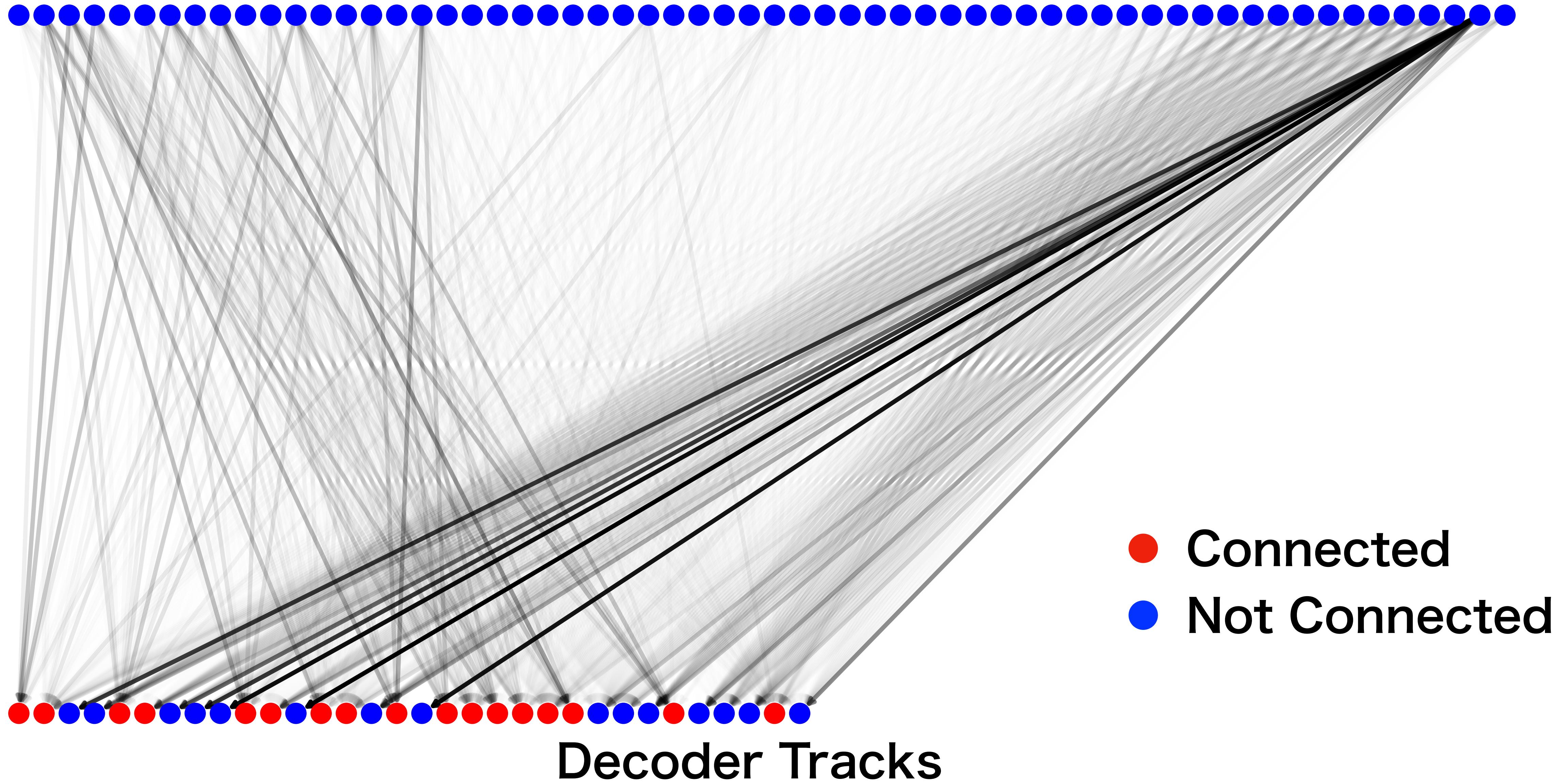
0 1 4 5 9 10 12 13 15 17 18 19 20 21 22 26 30

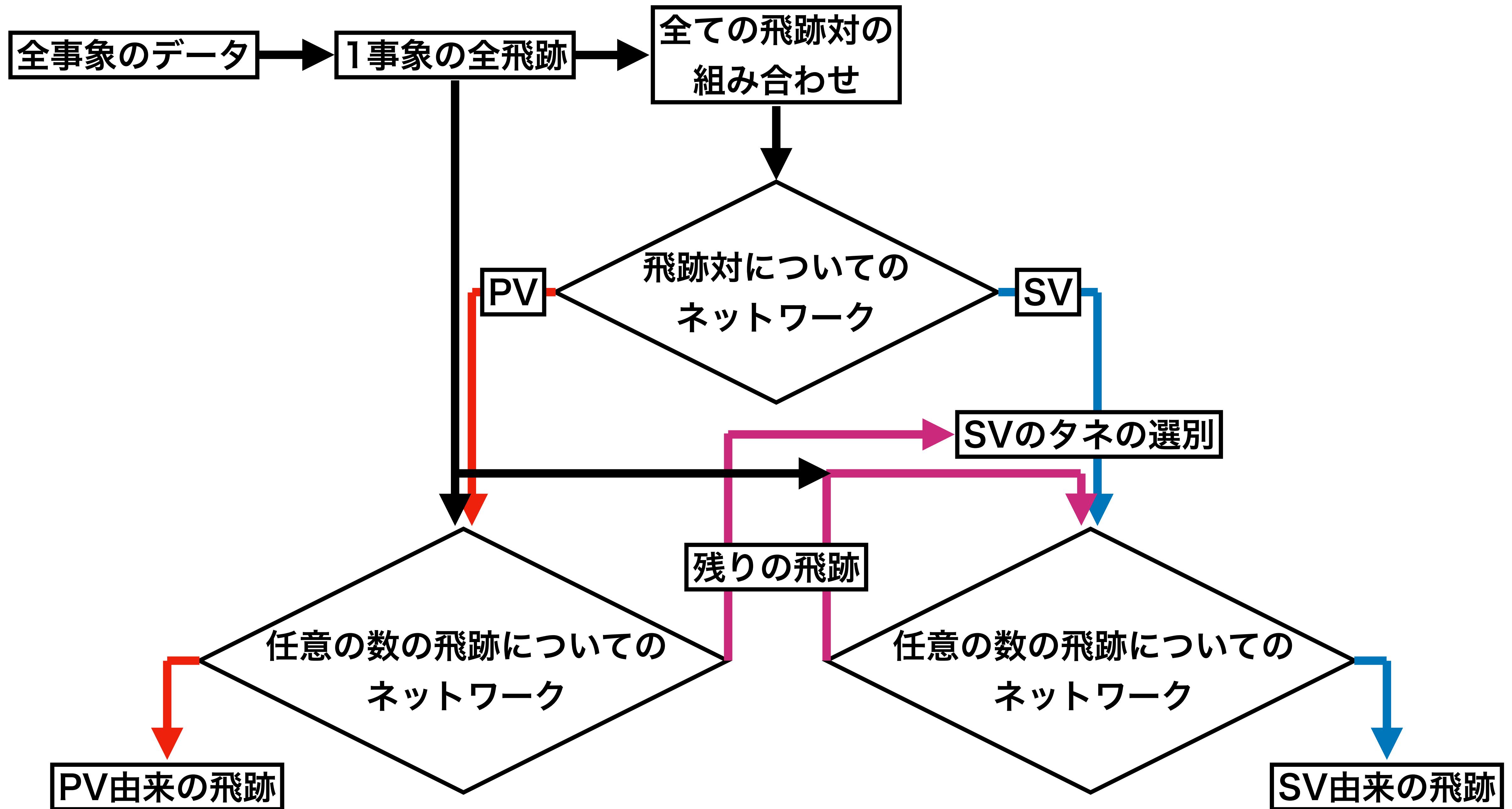


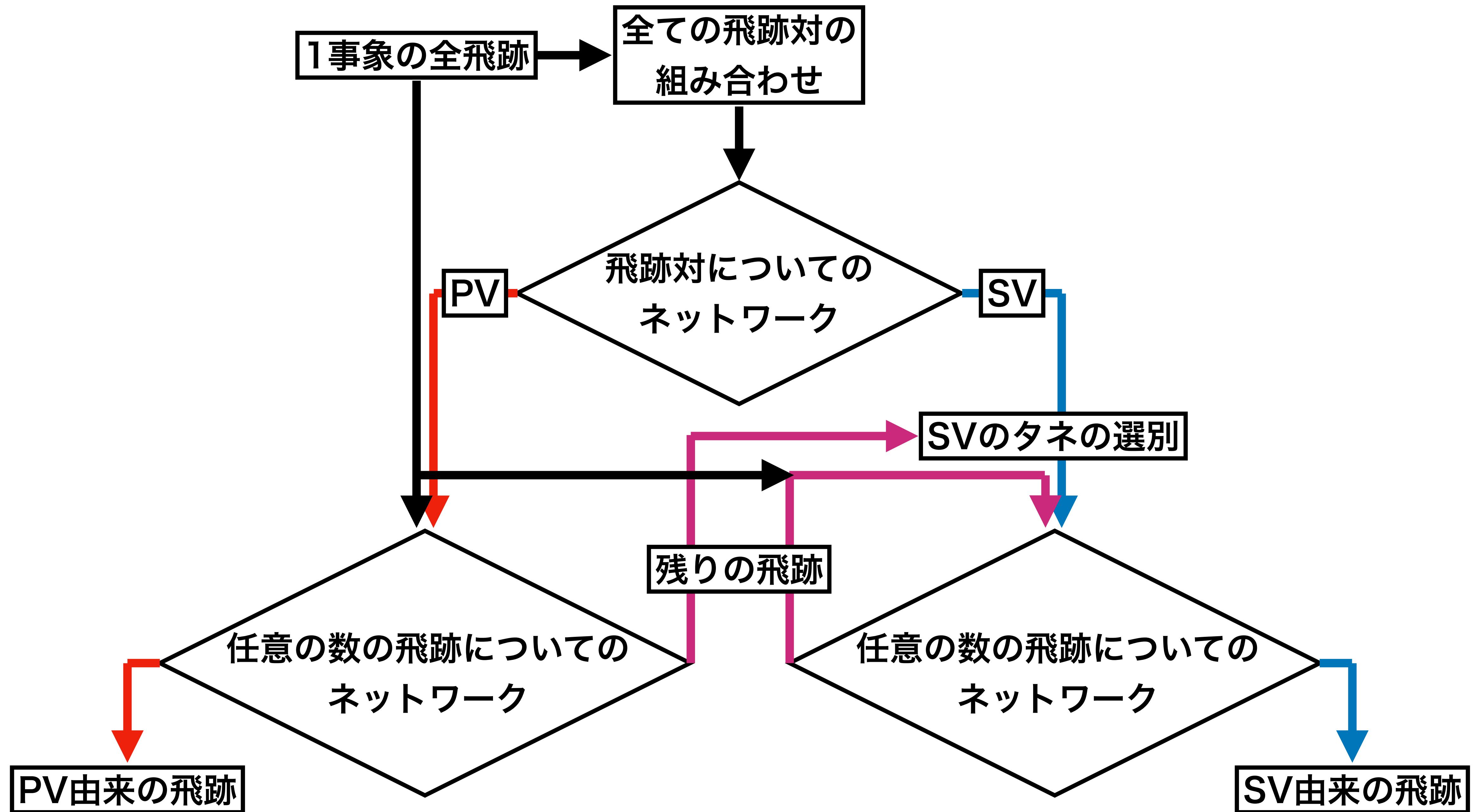
Encoder Tracks

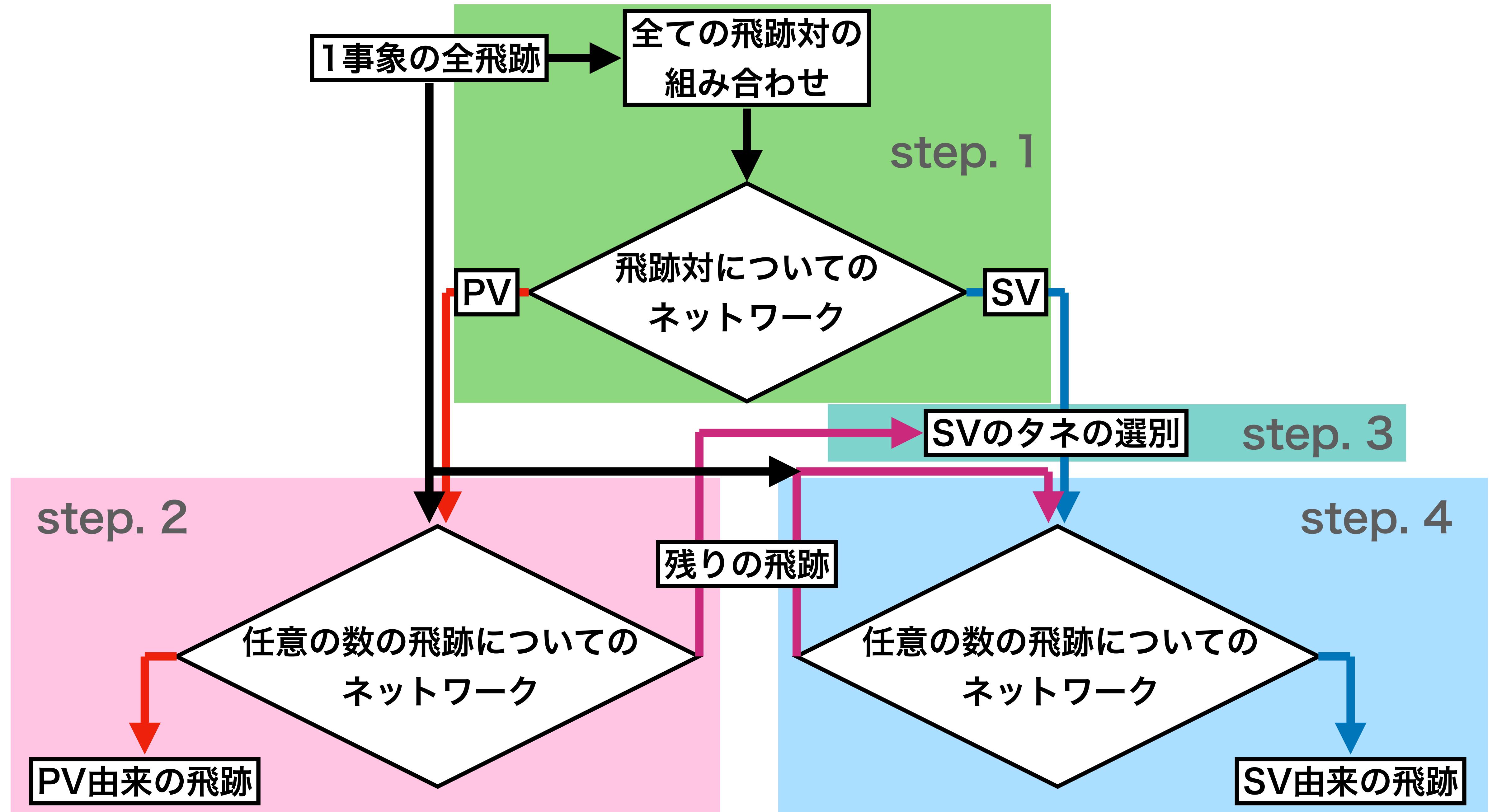
Attention Weight Graph

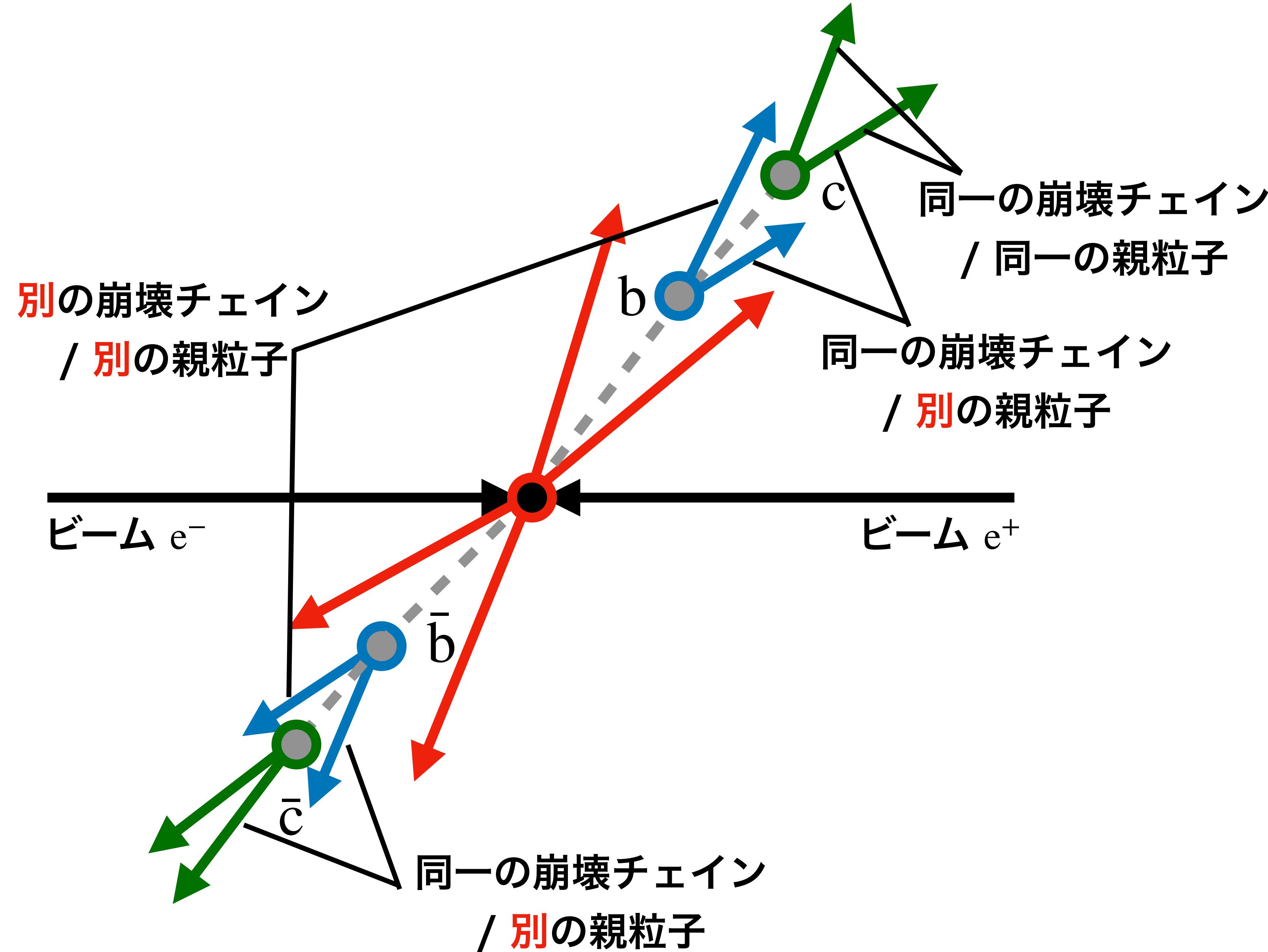
Encoder Tracks

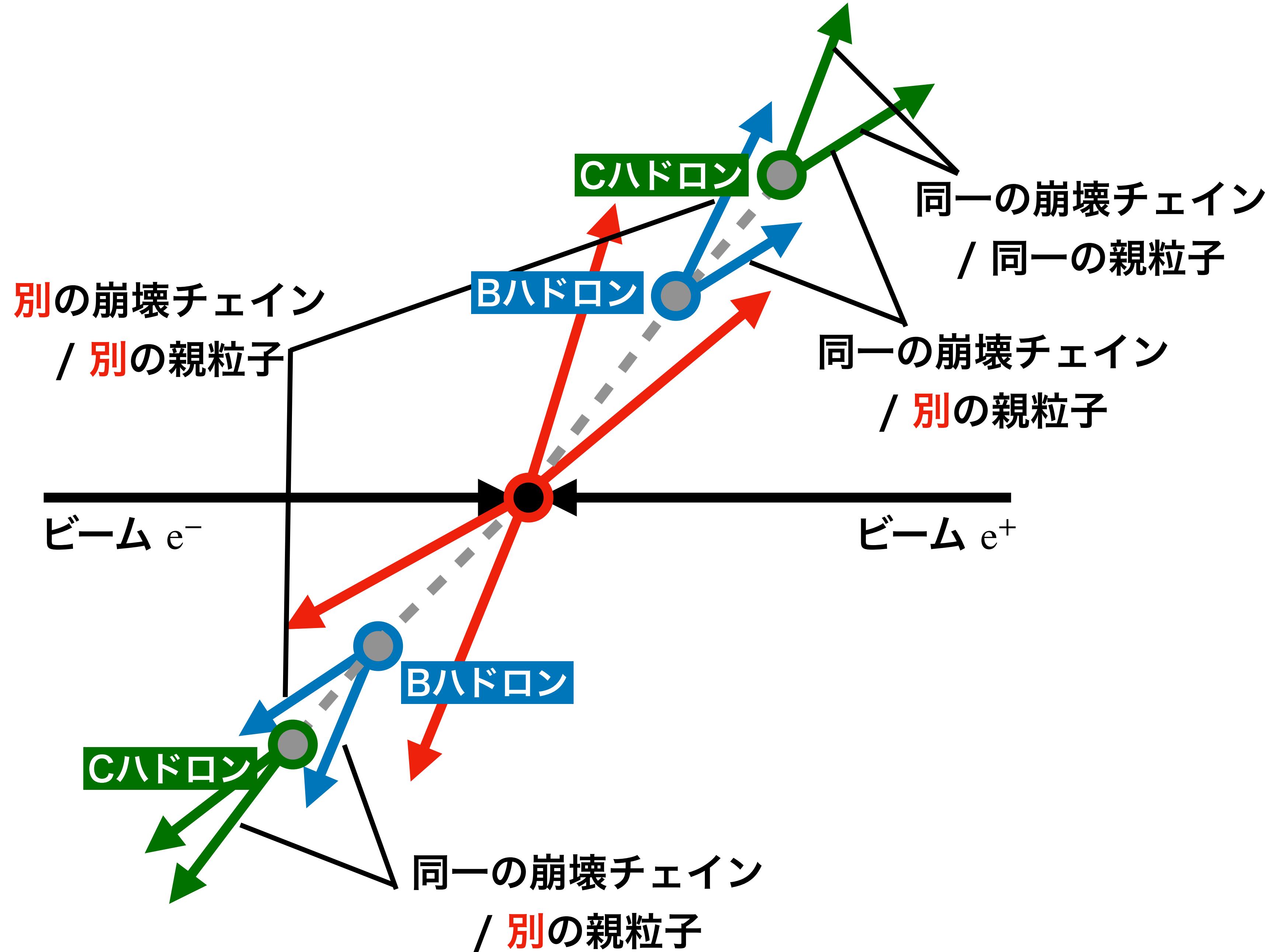


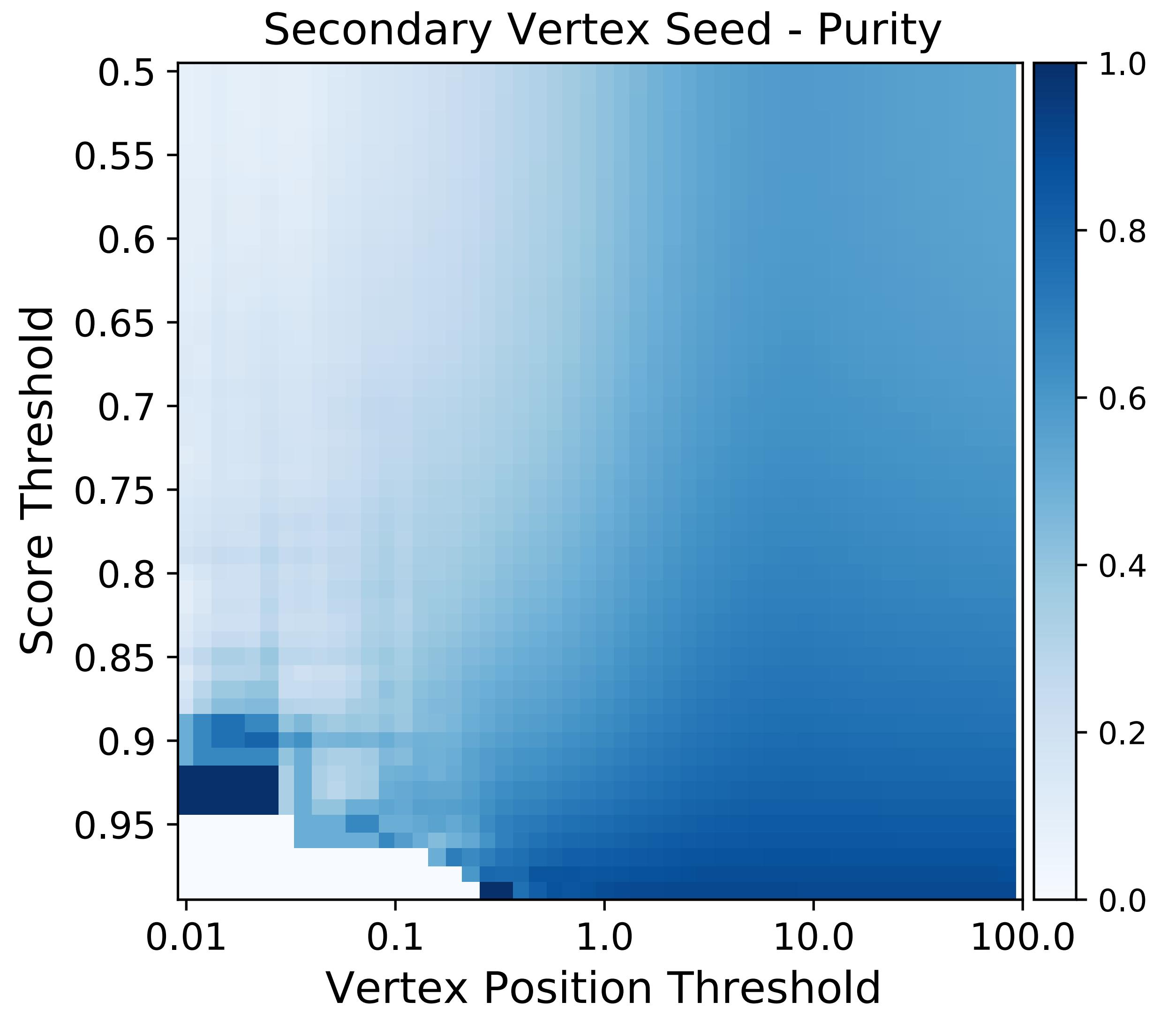
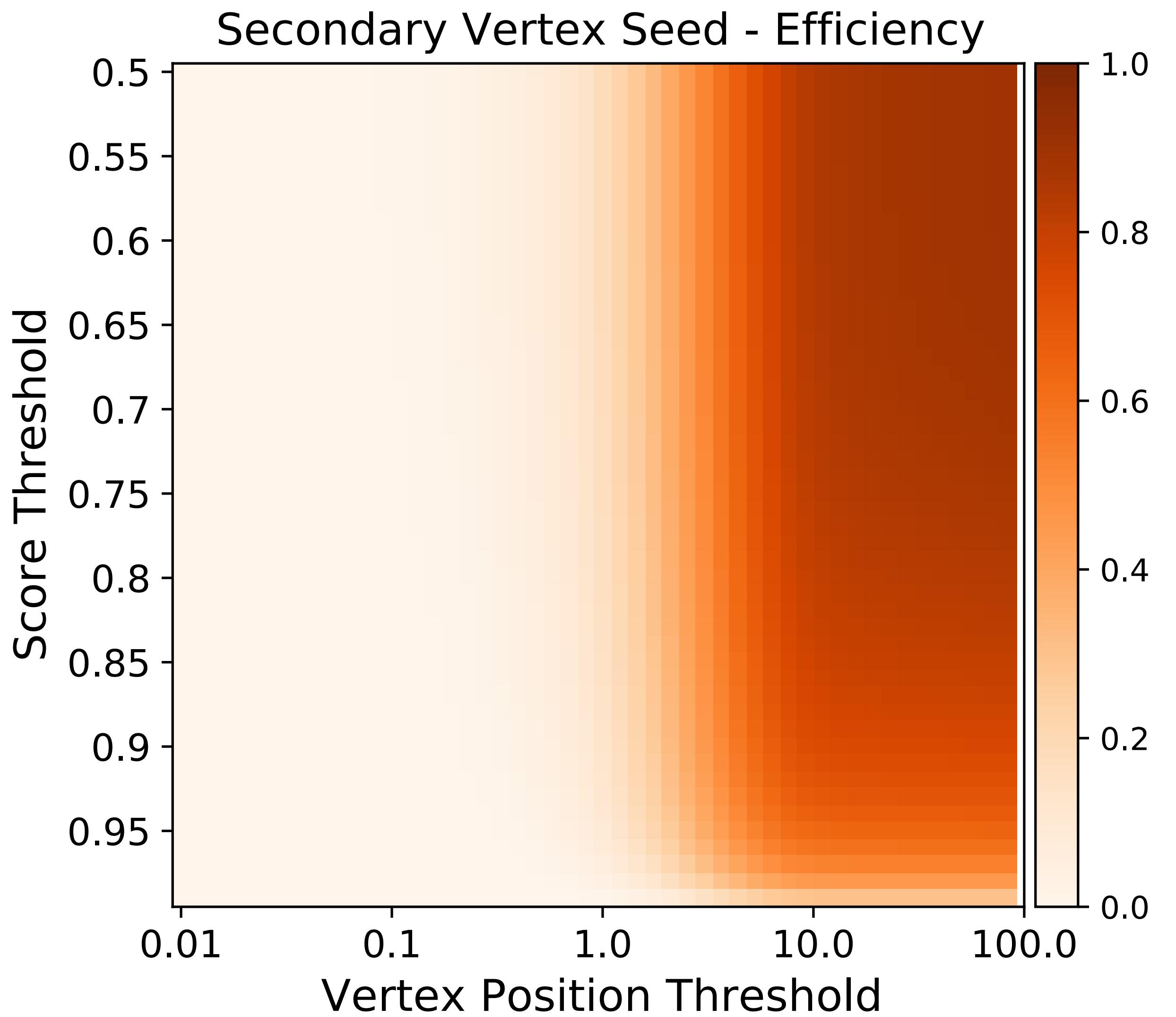




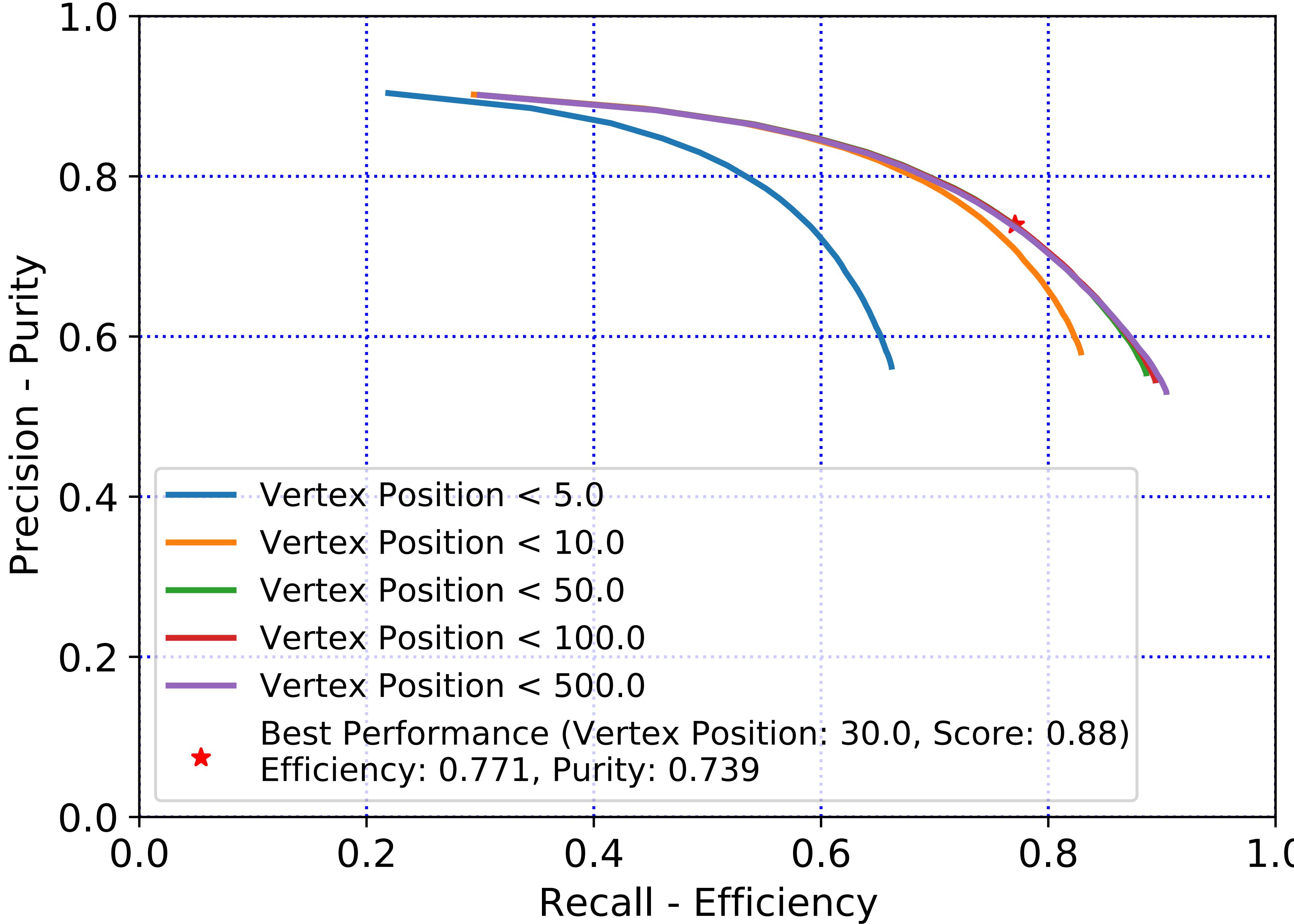


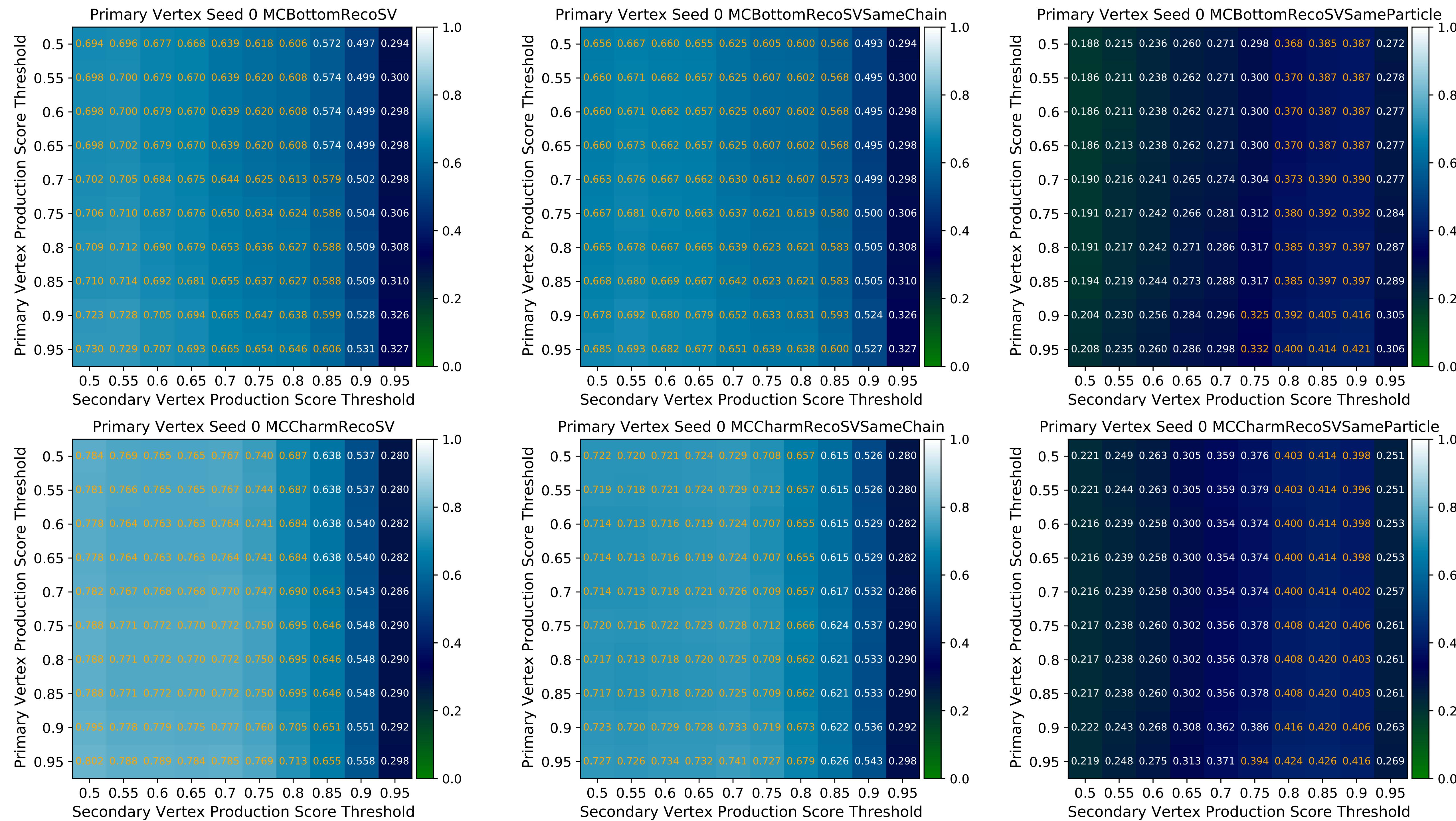


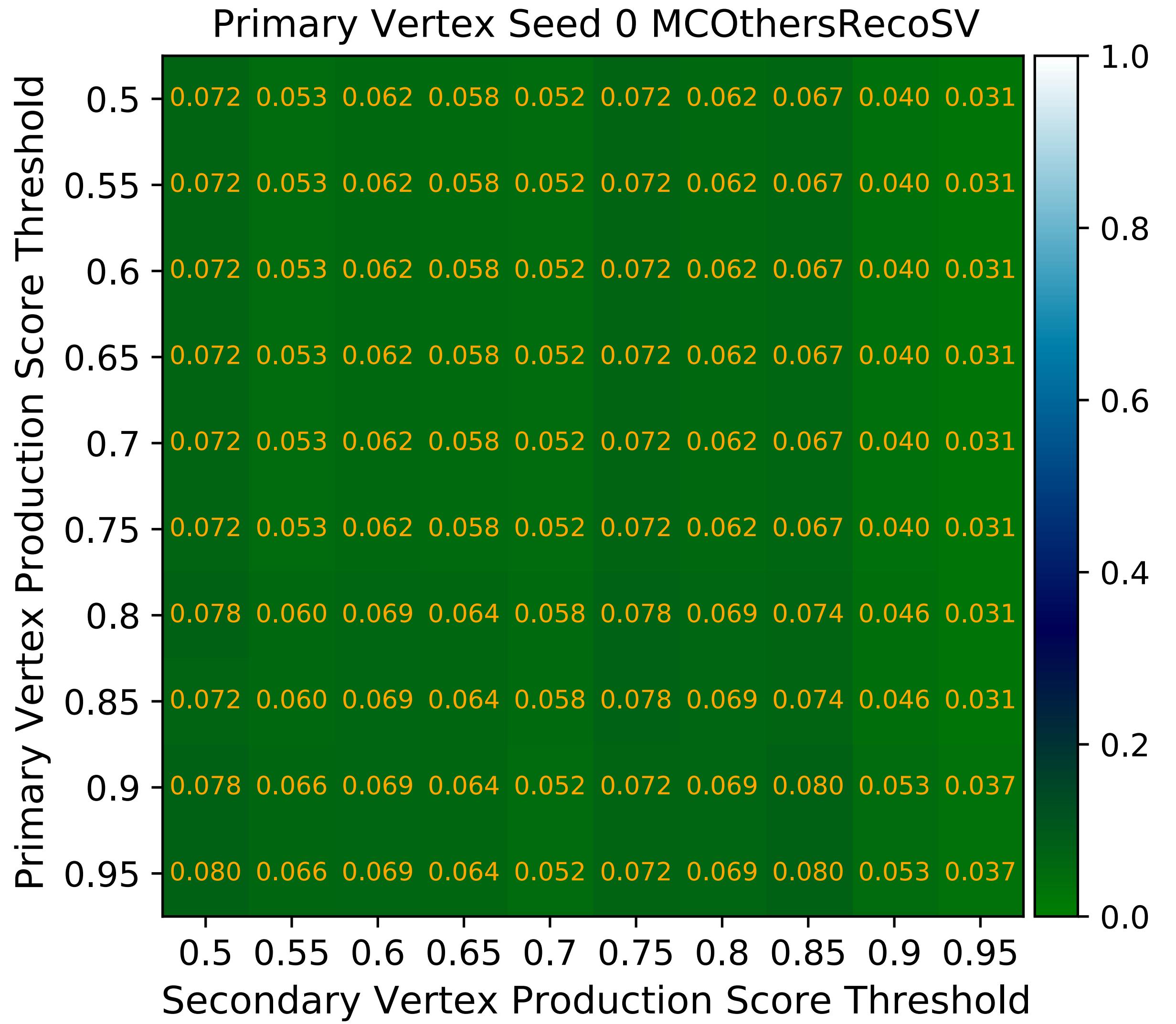
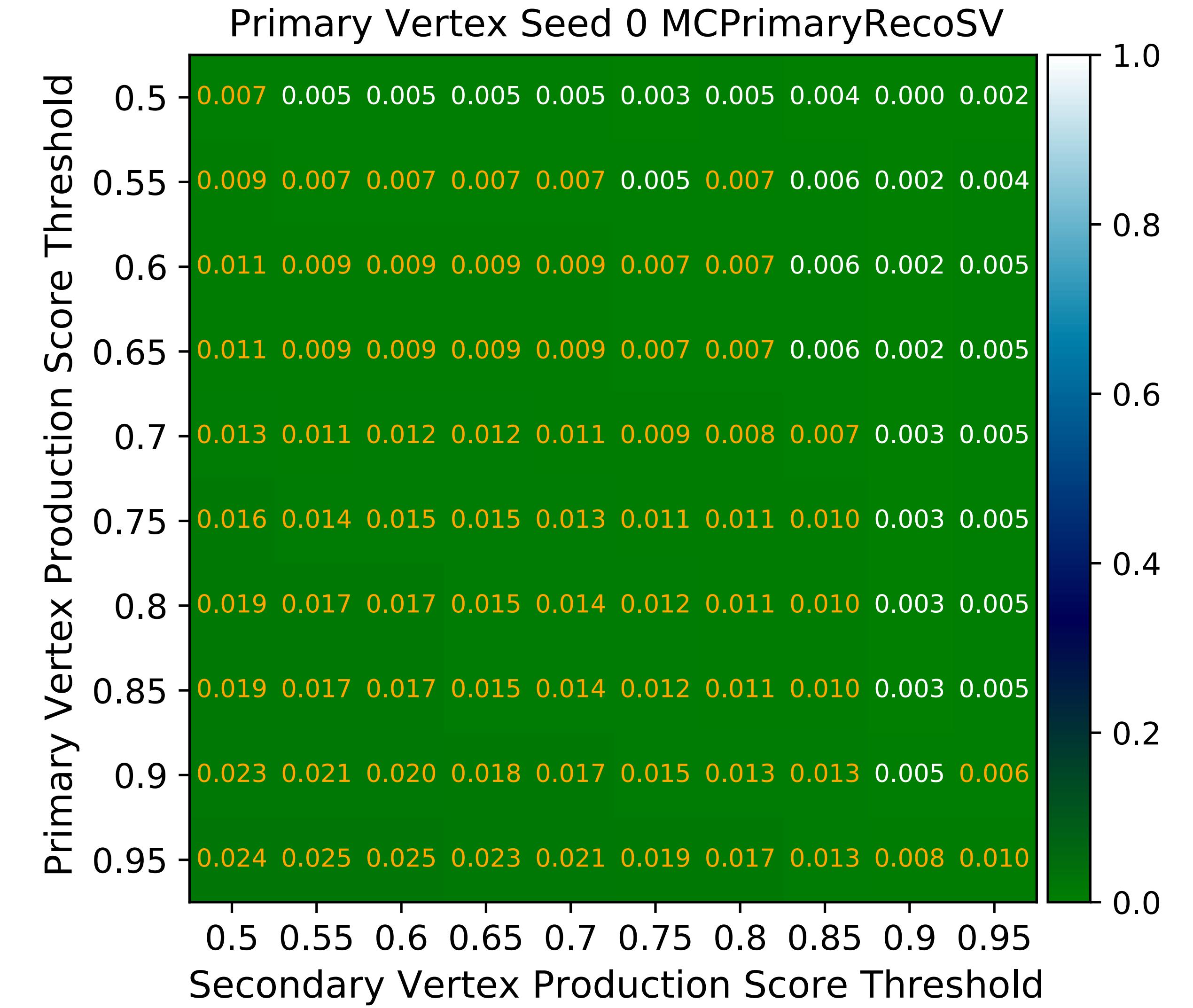


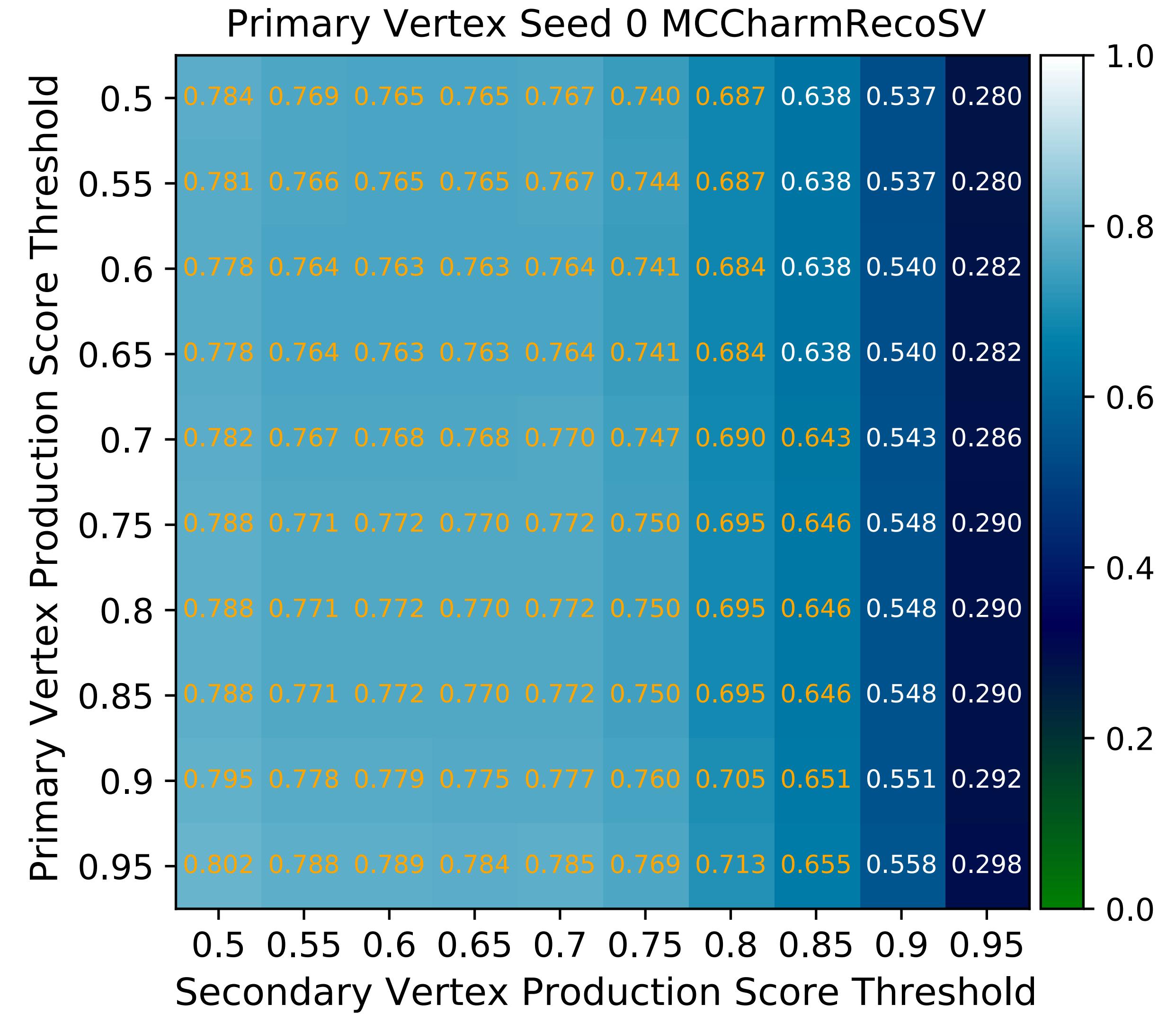
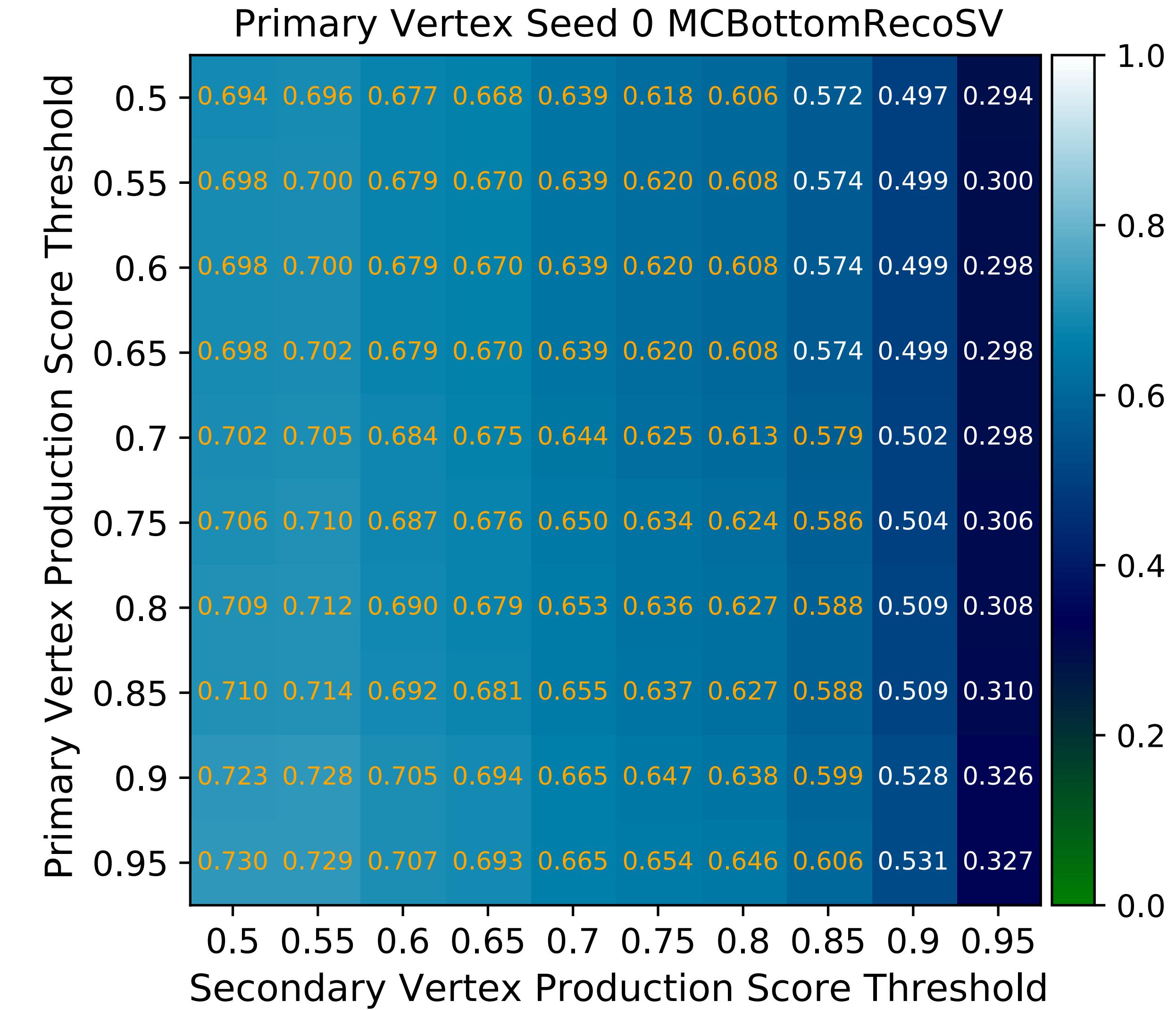


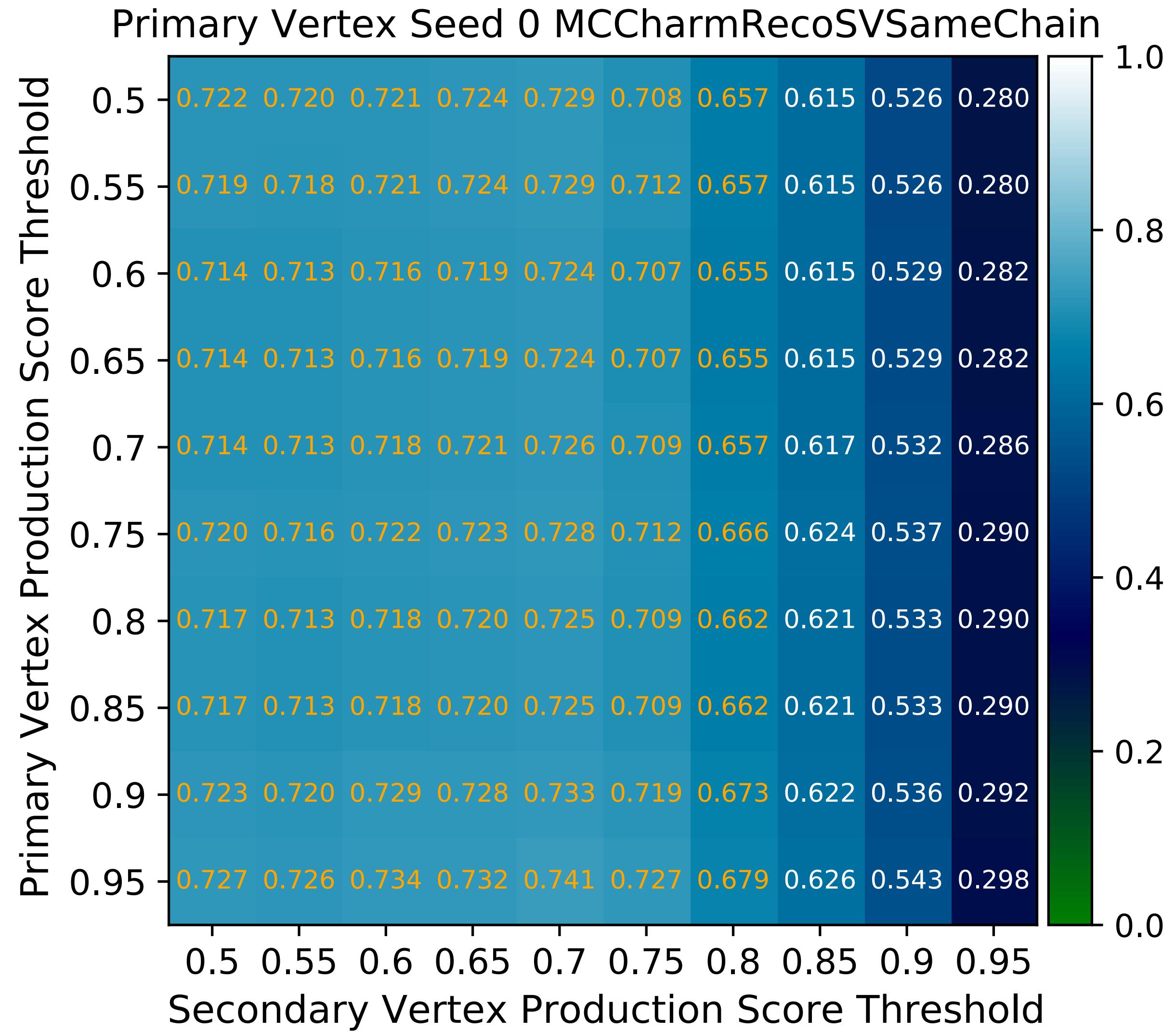
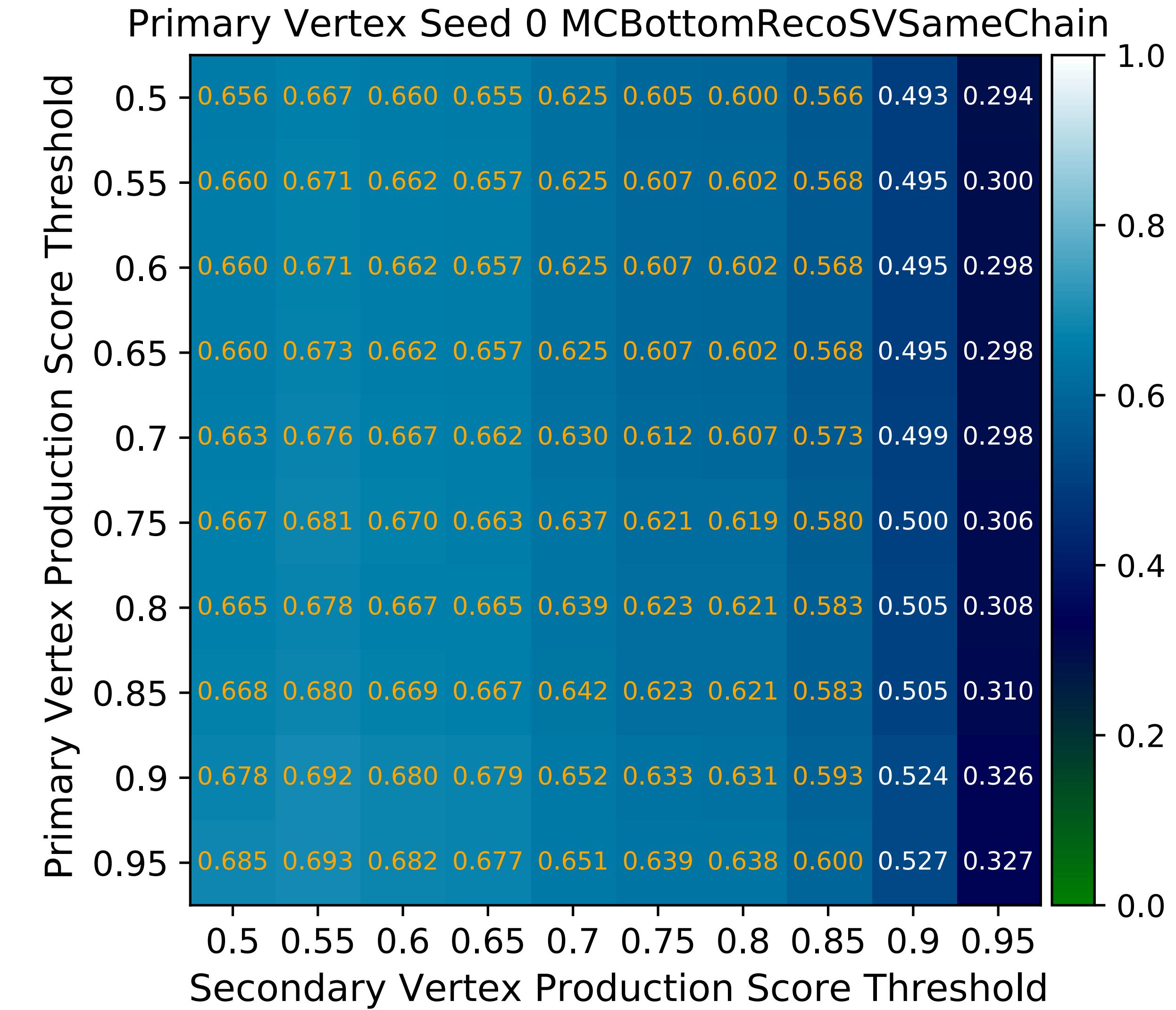
SV Seed Selection PR Curve

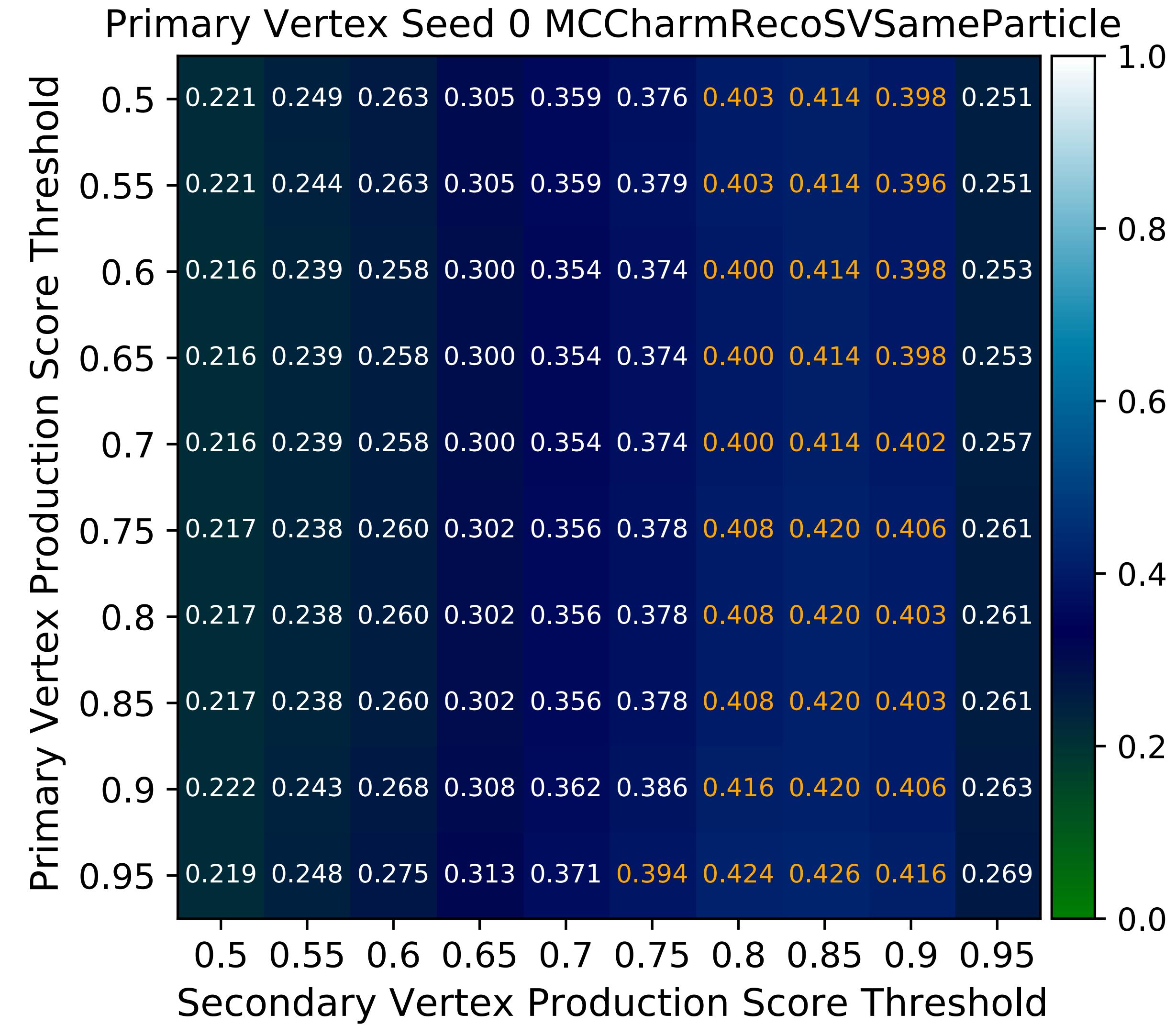
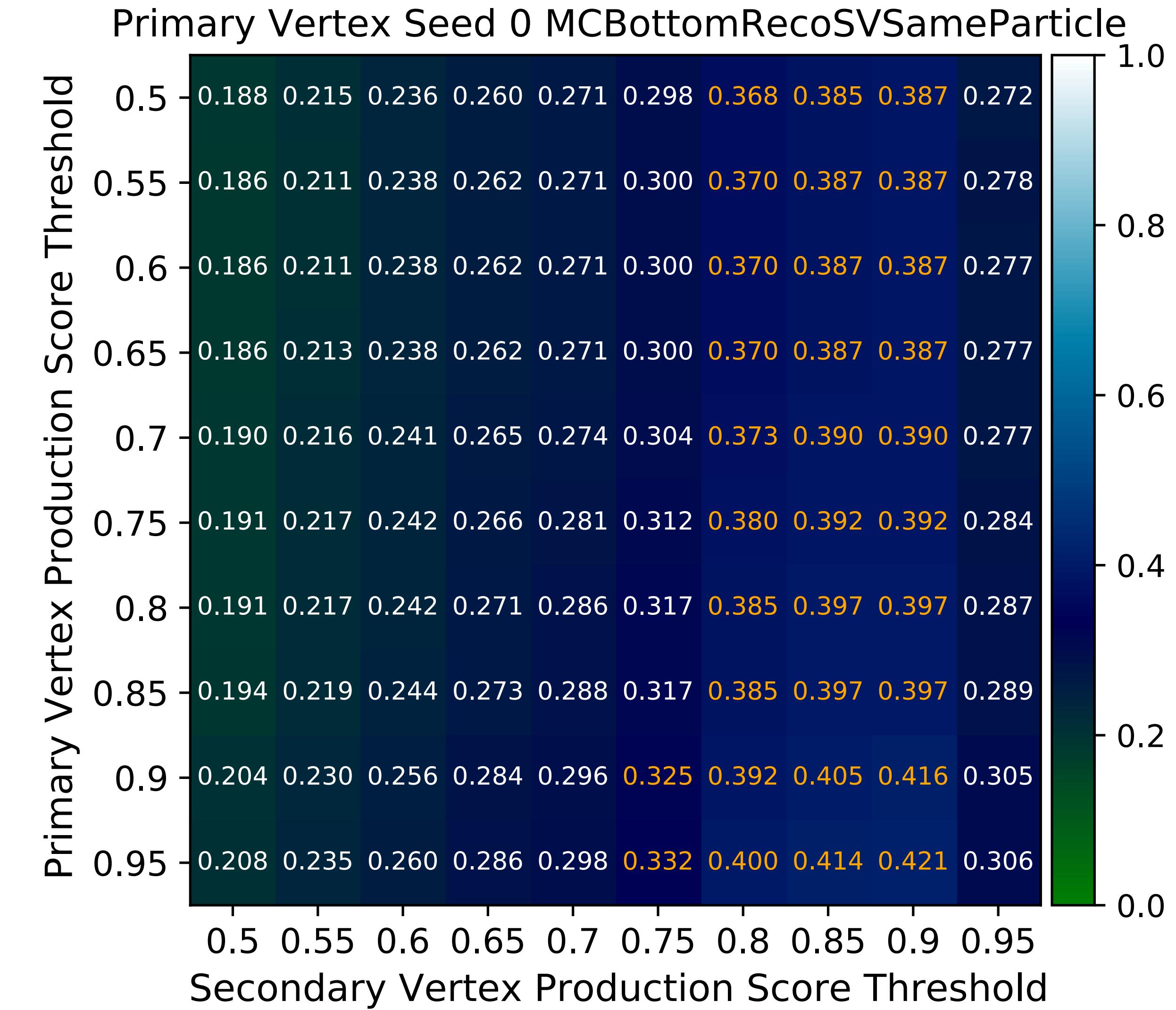


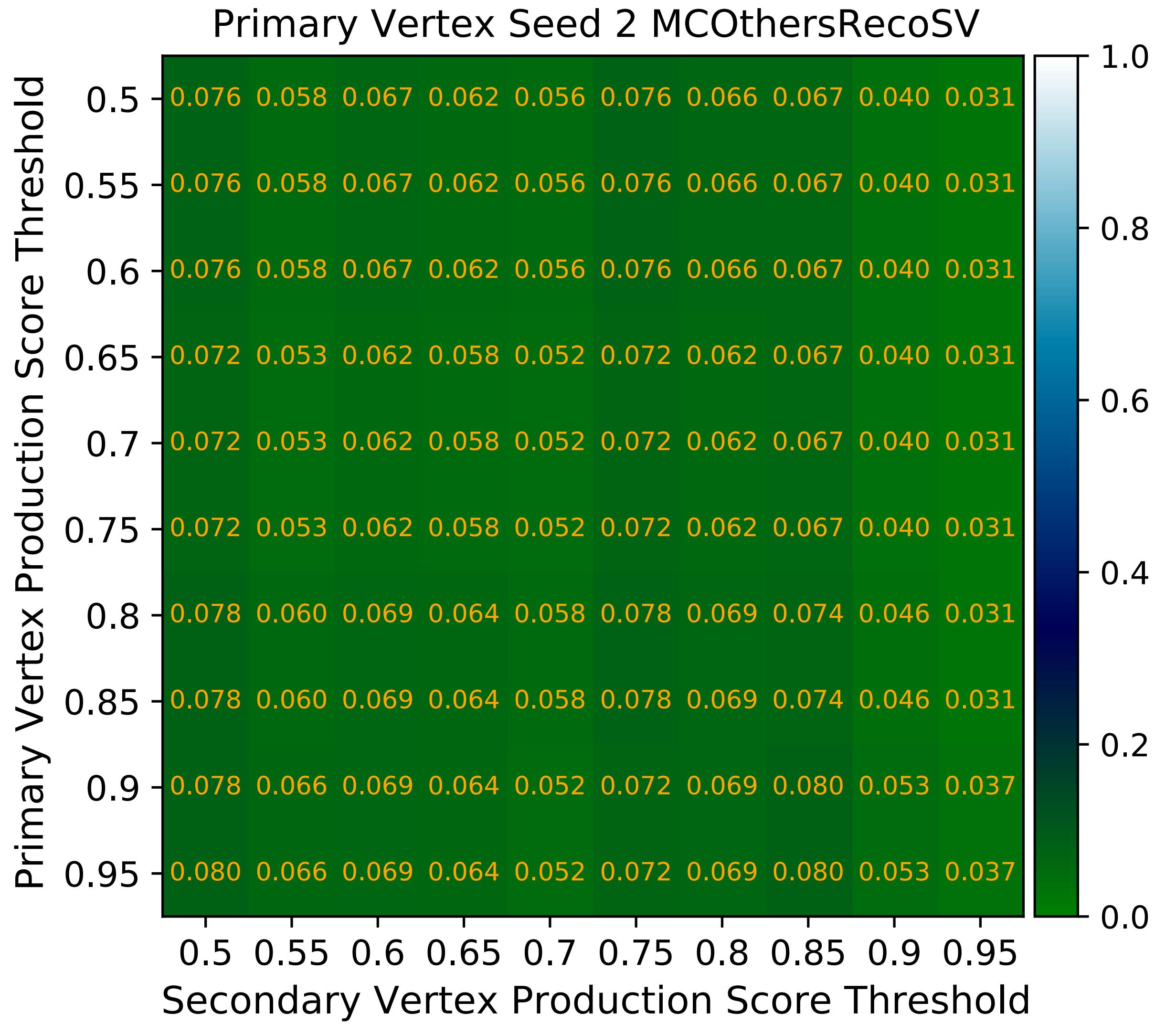
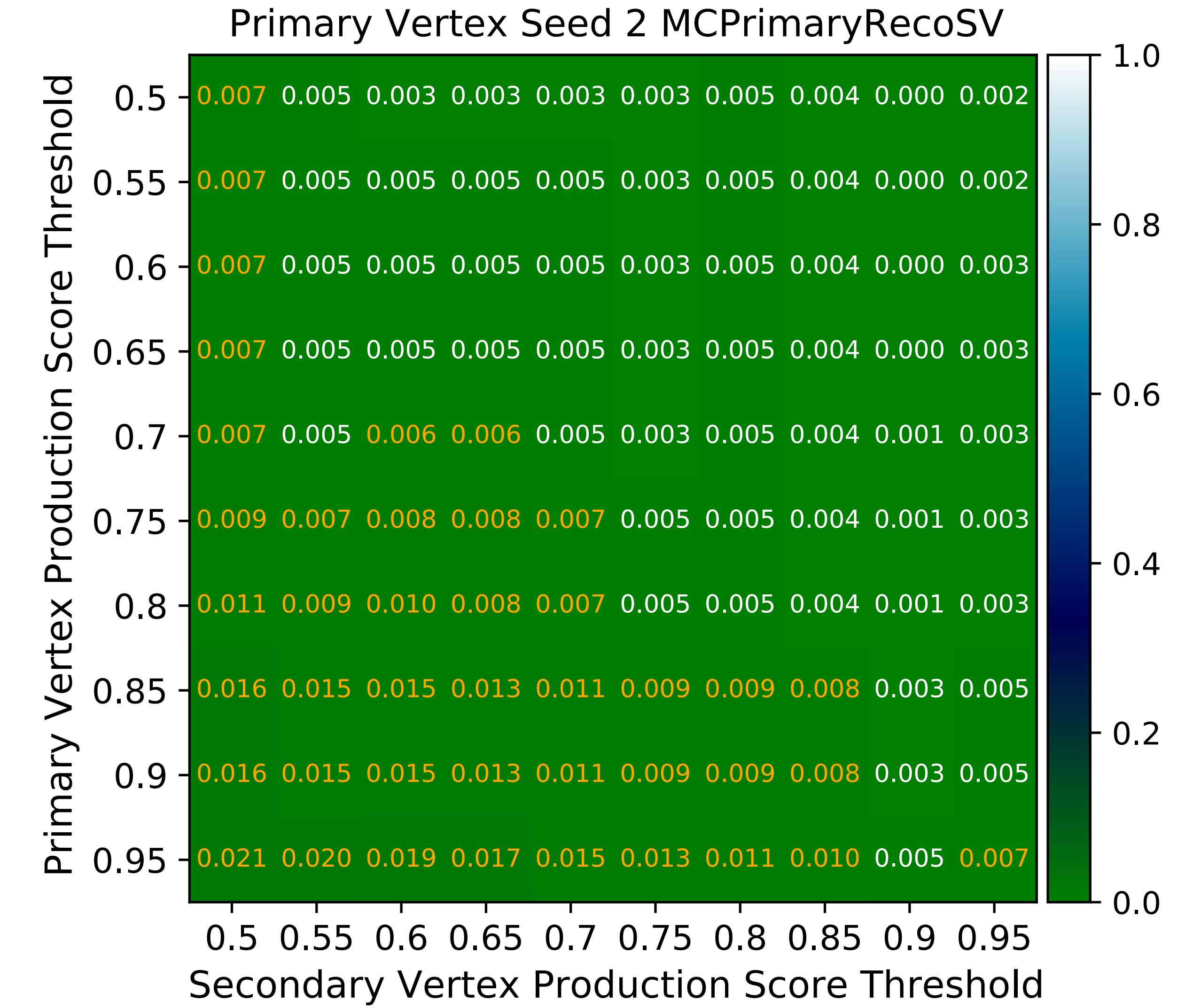


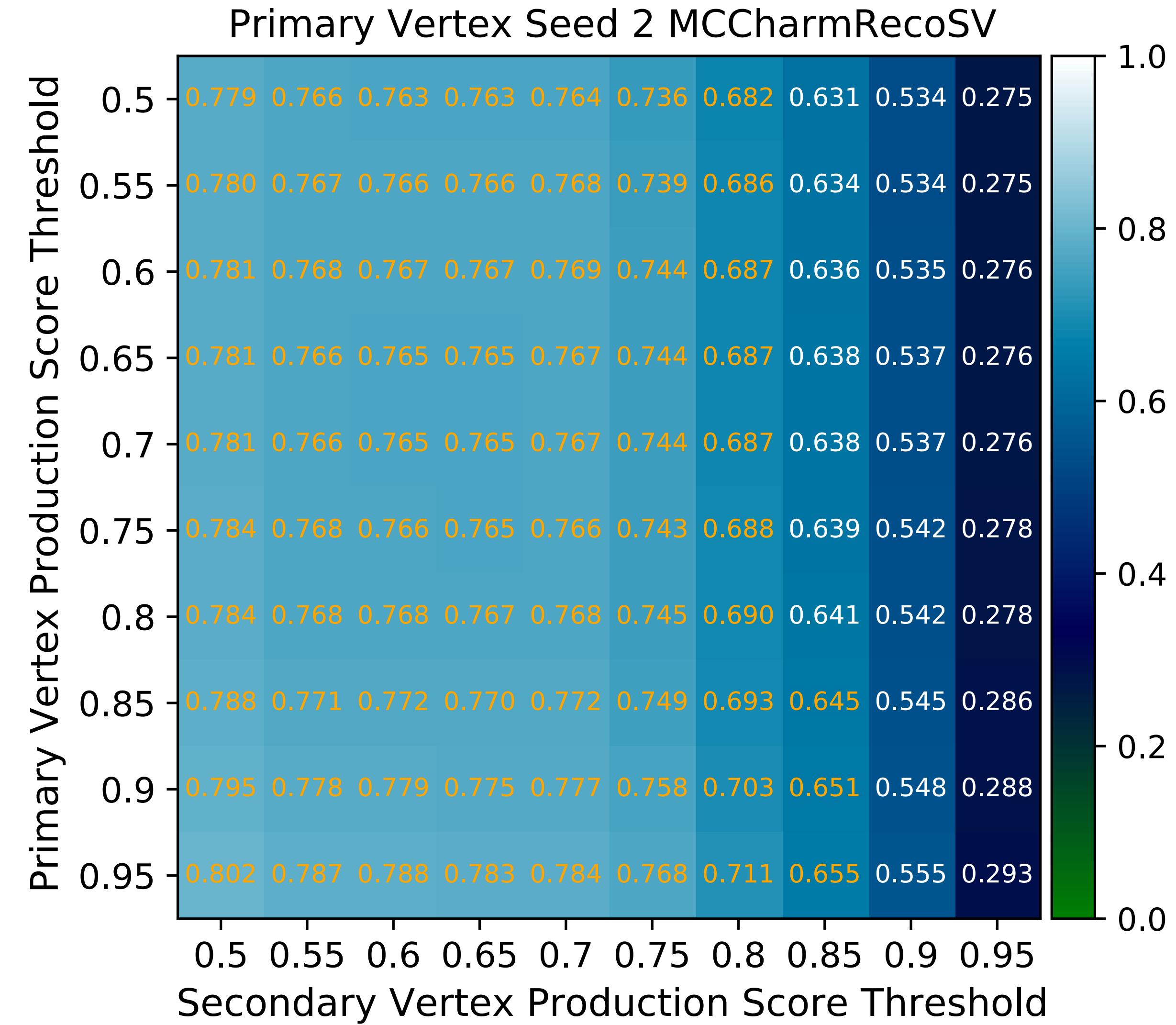
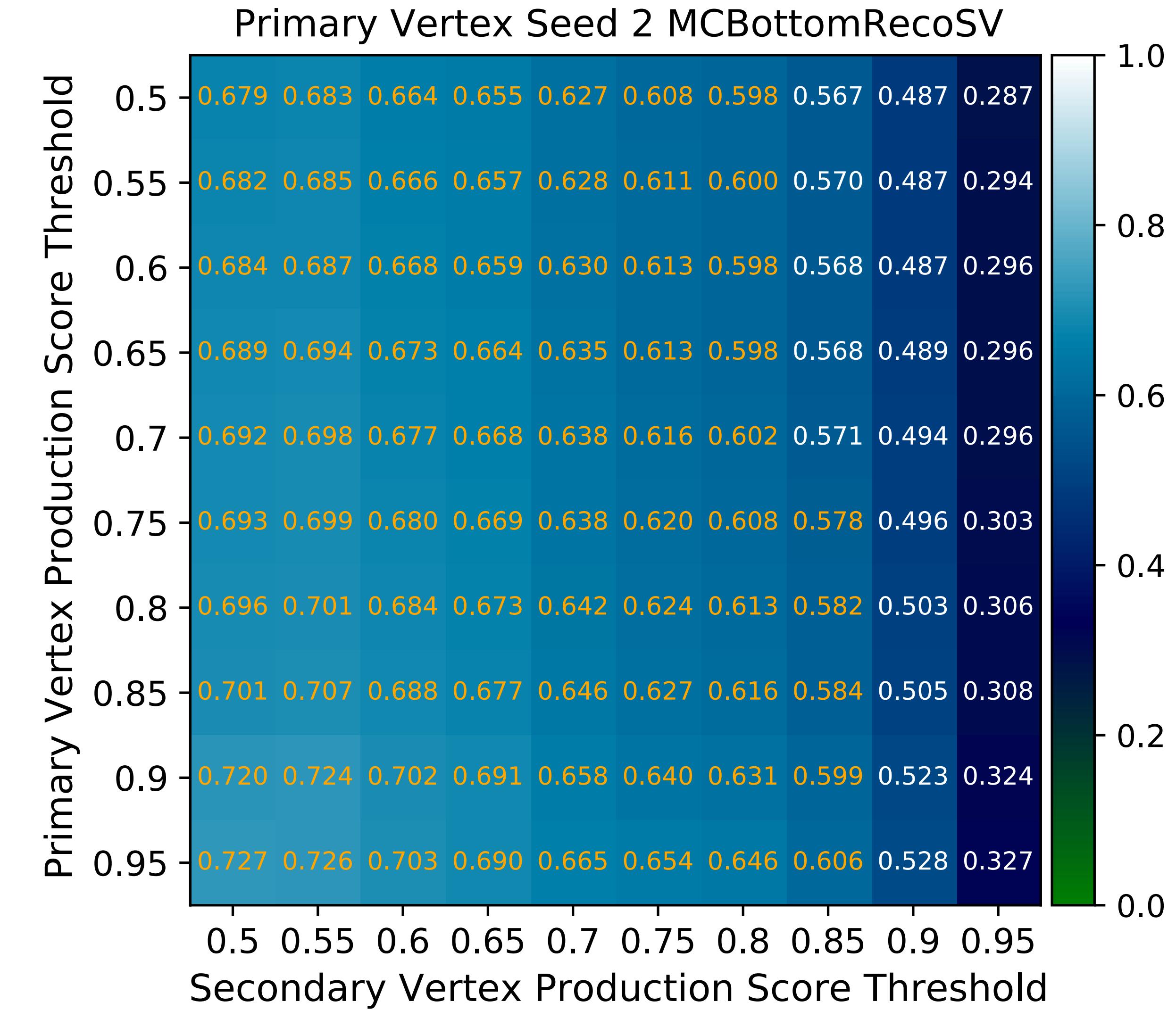


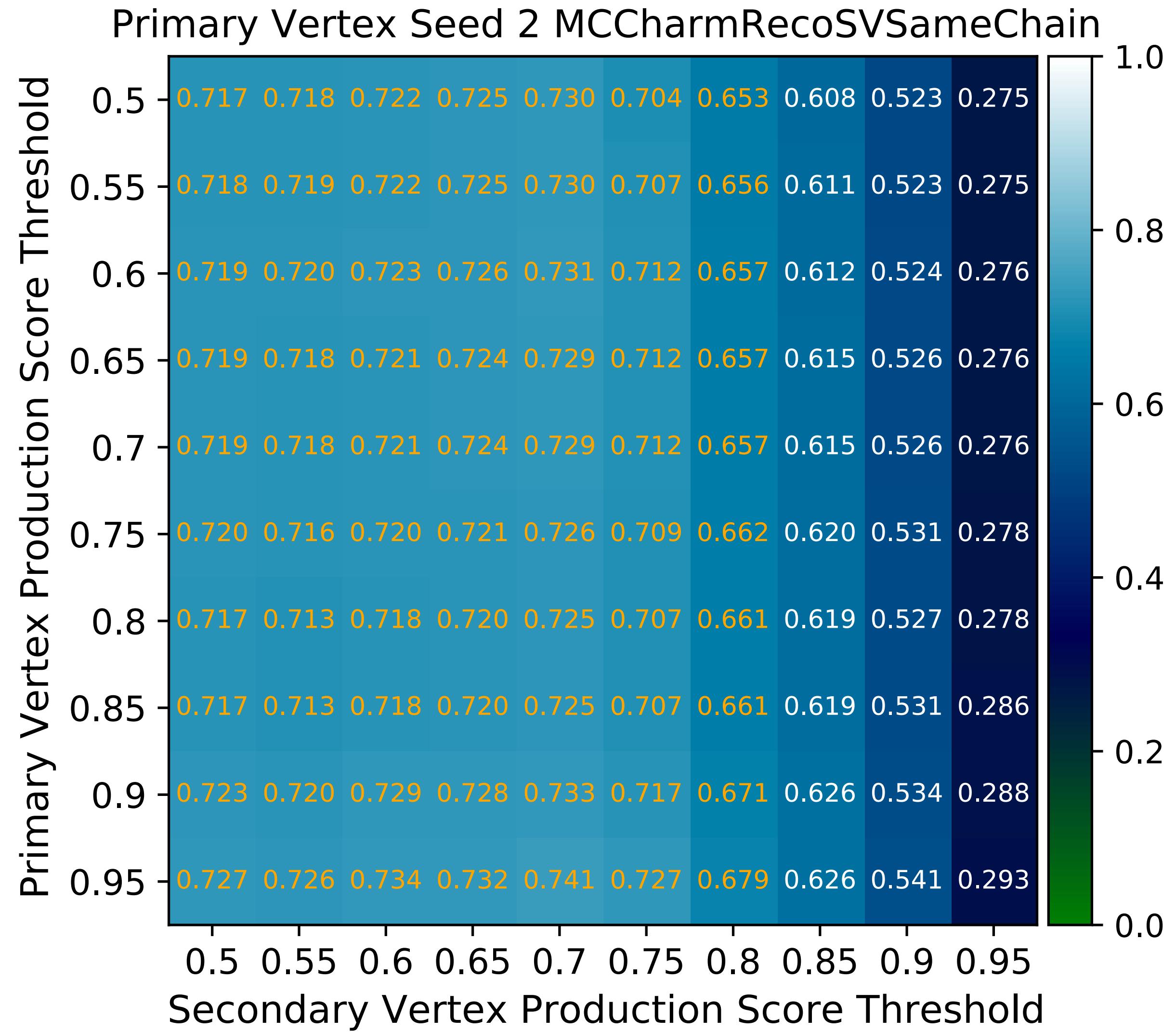
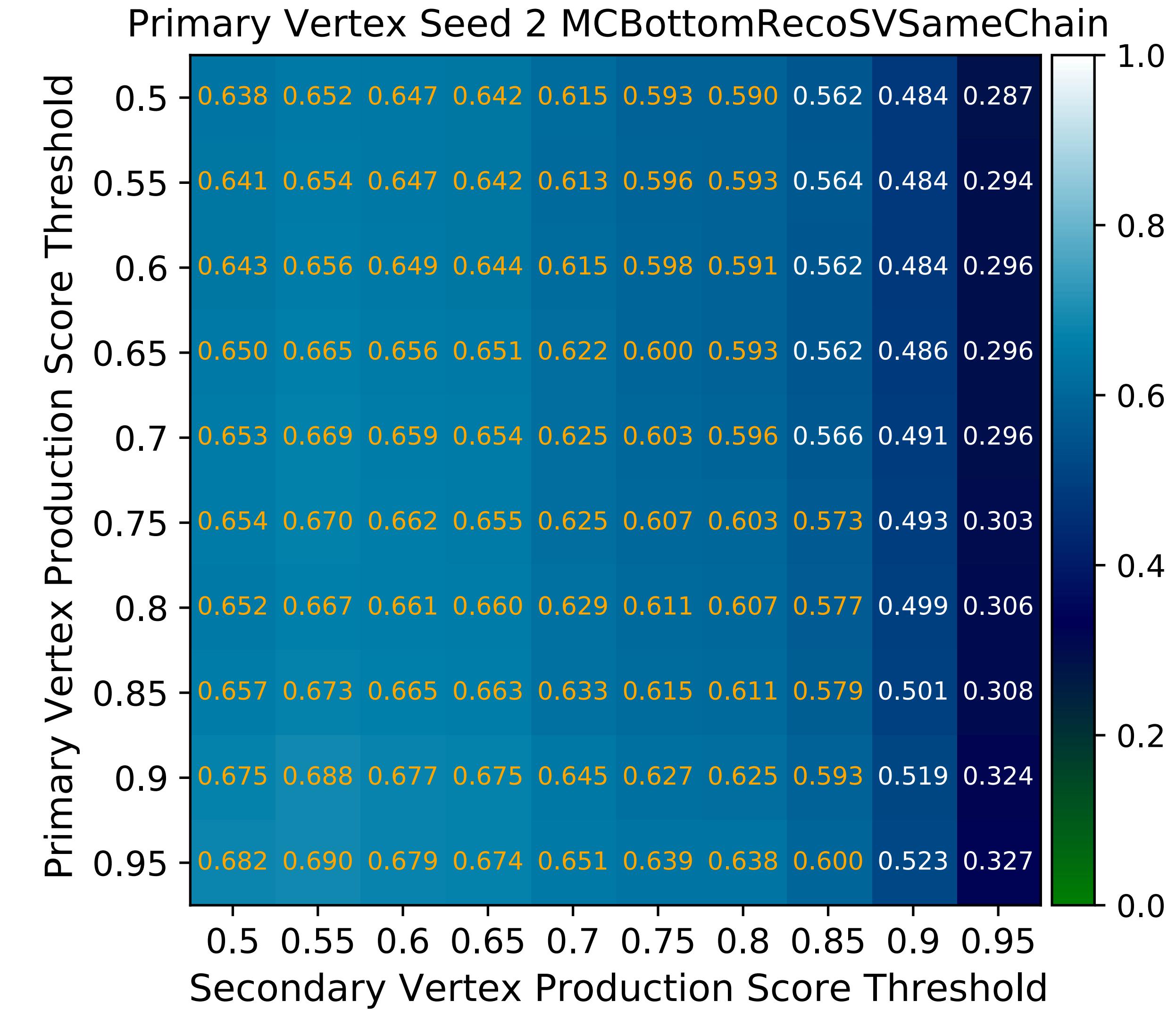


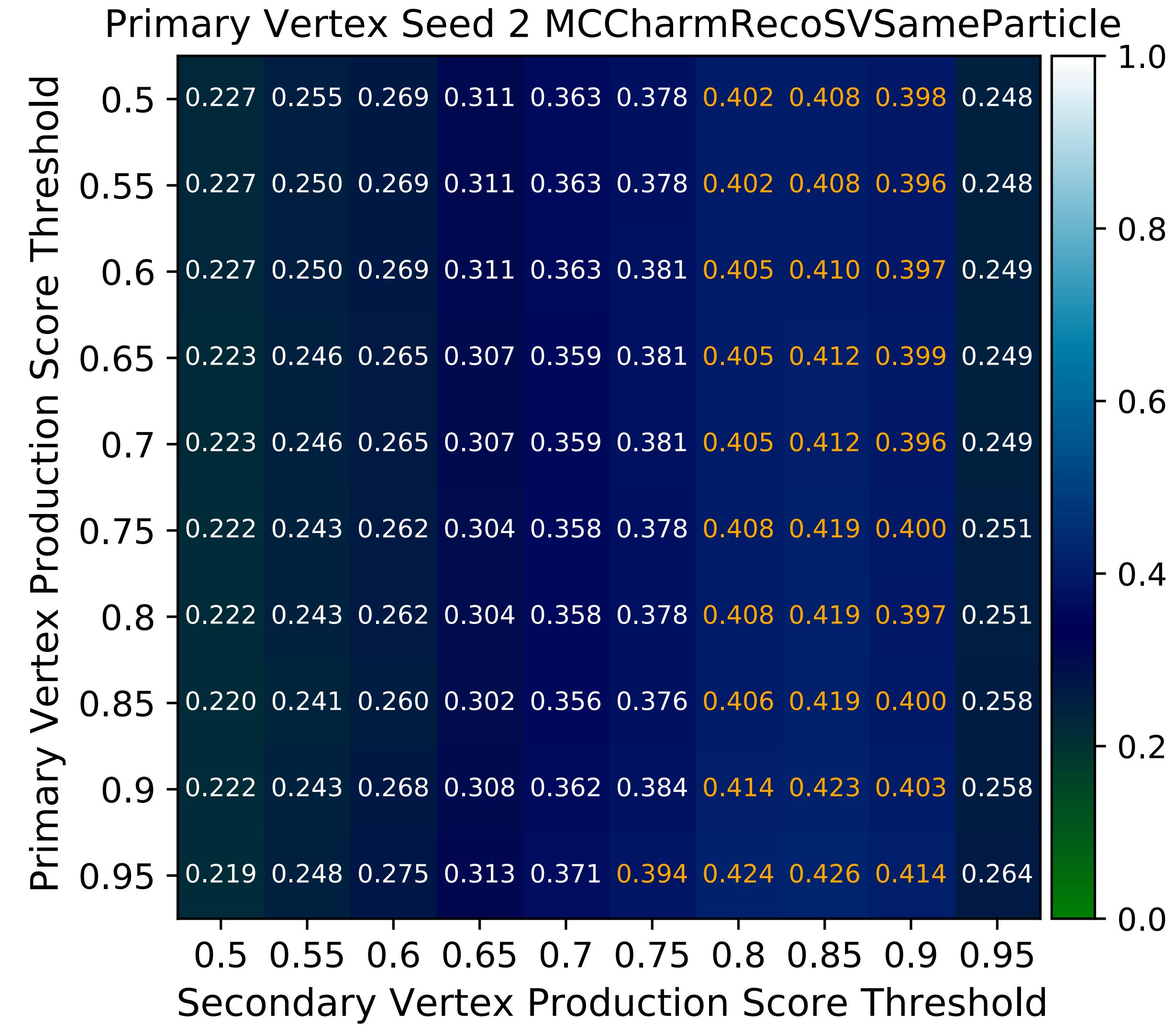
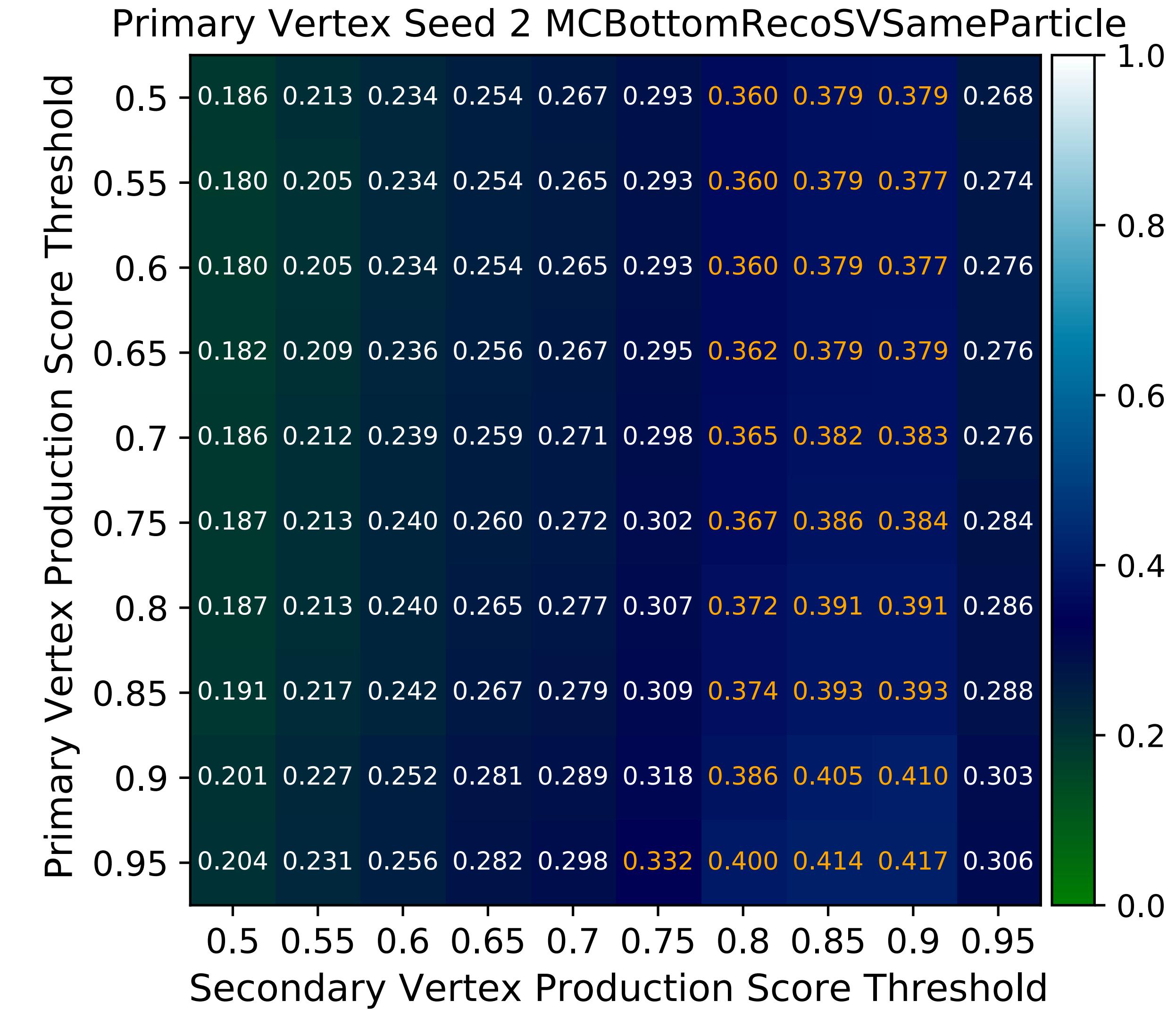




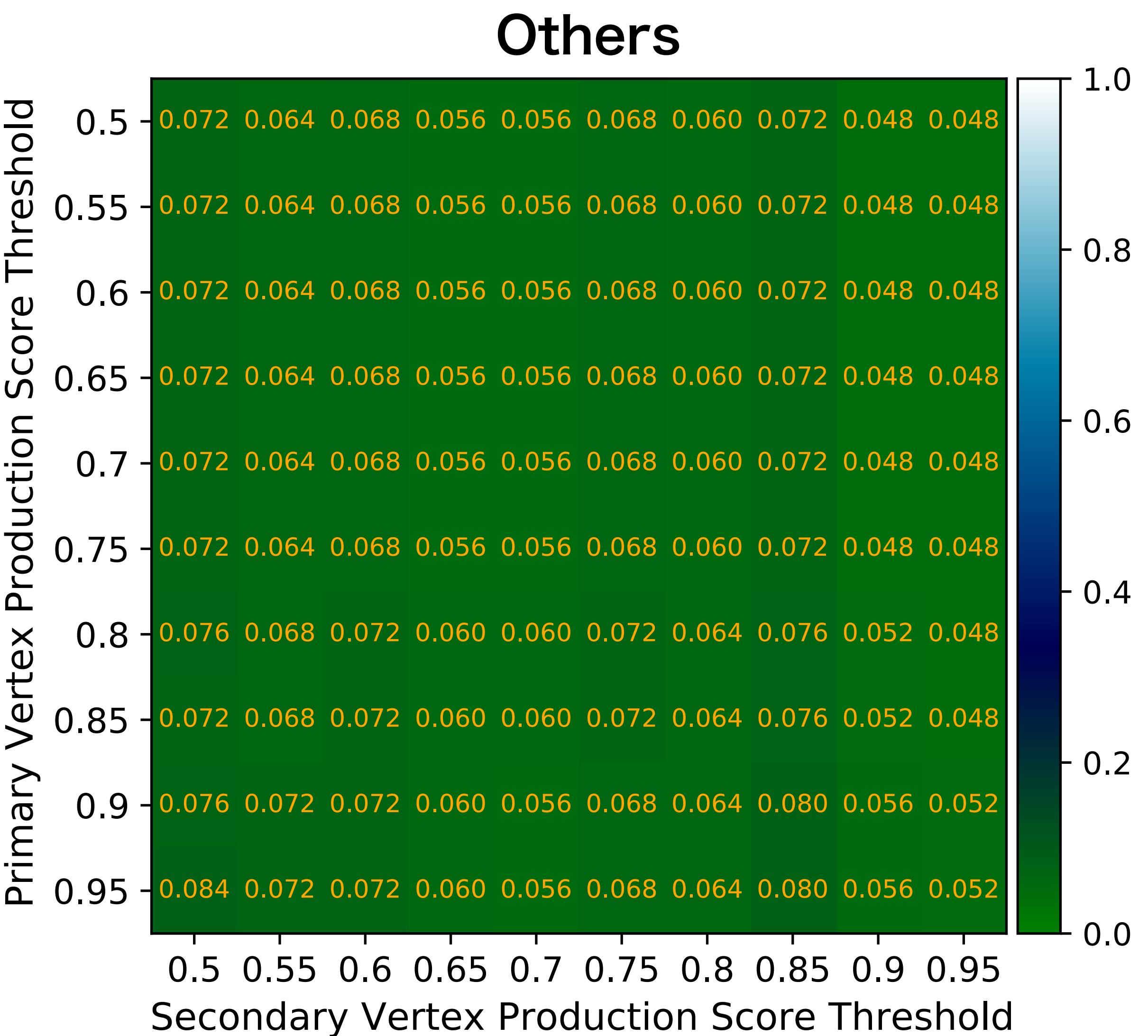
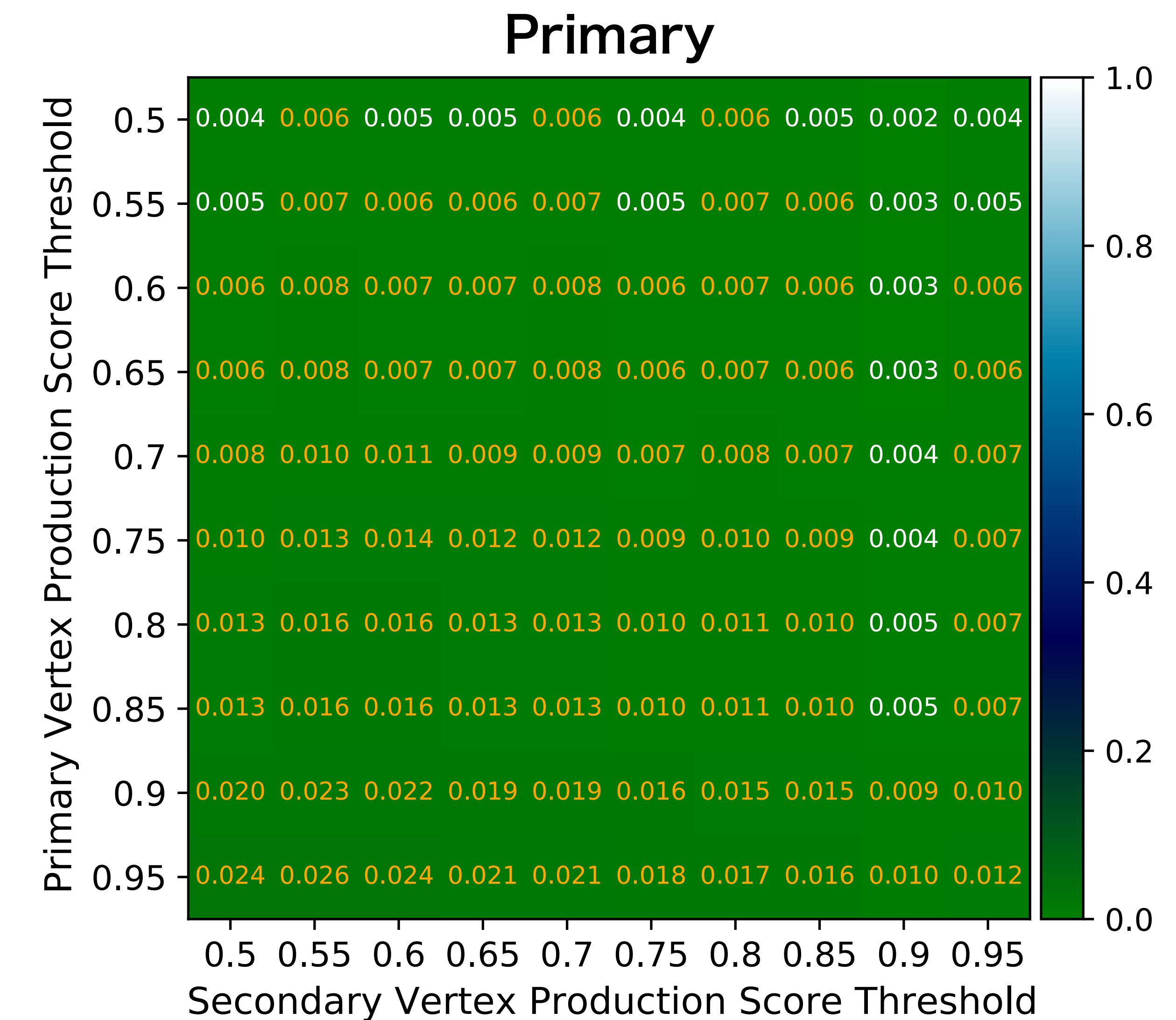




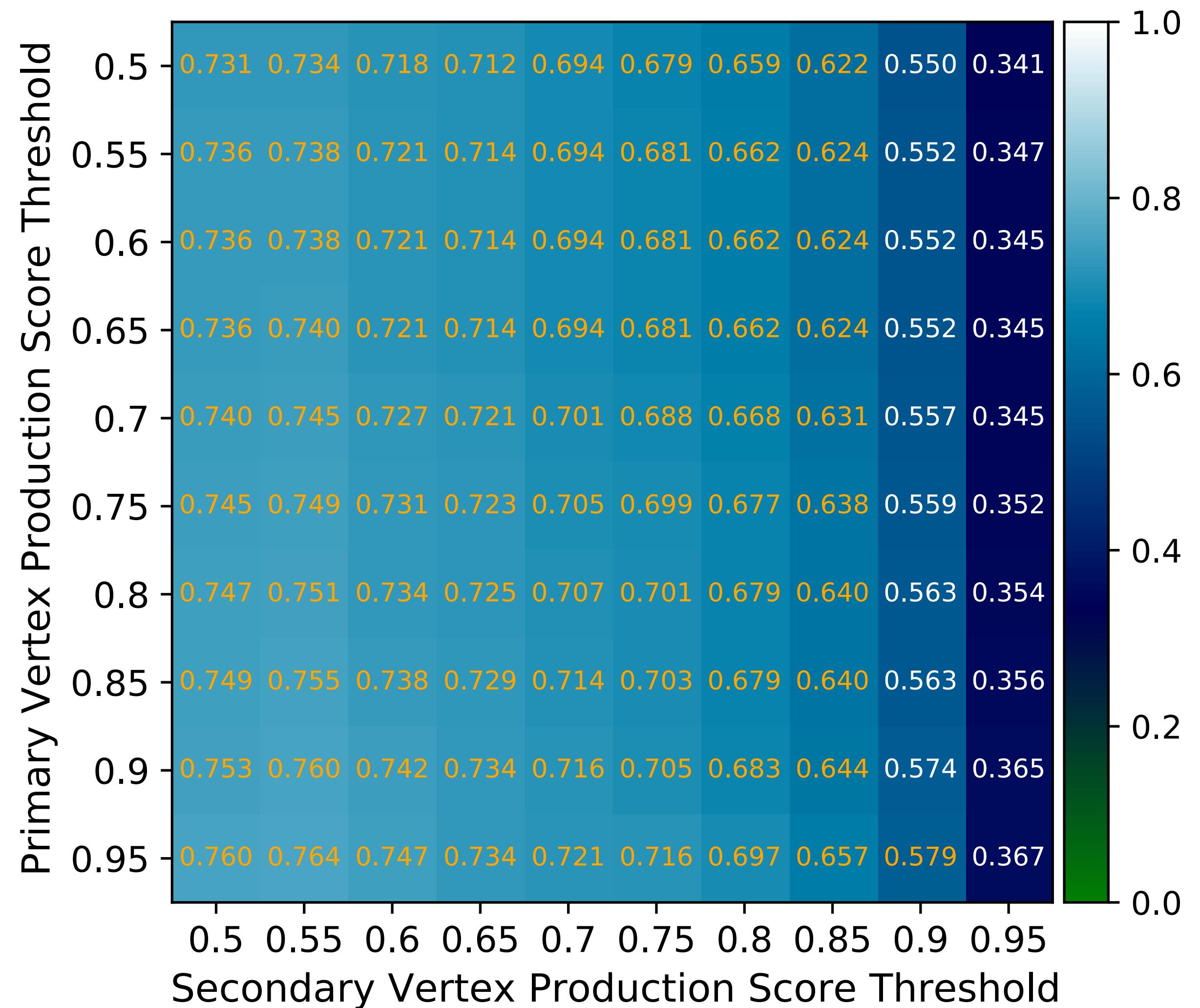




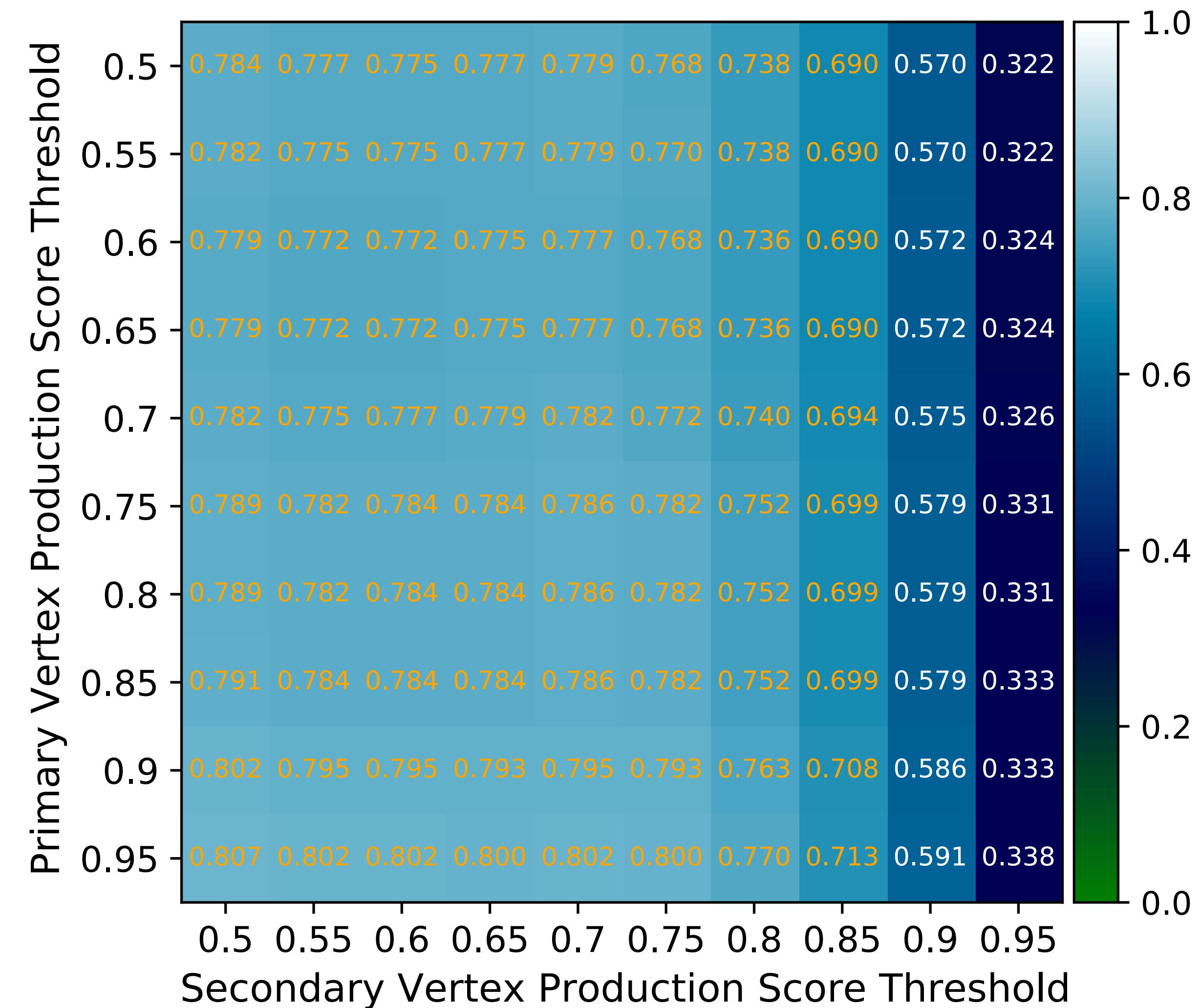
Track base



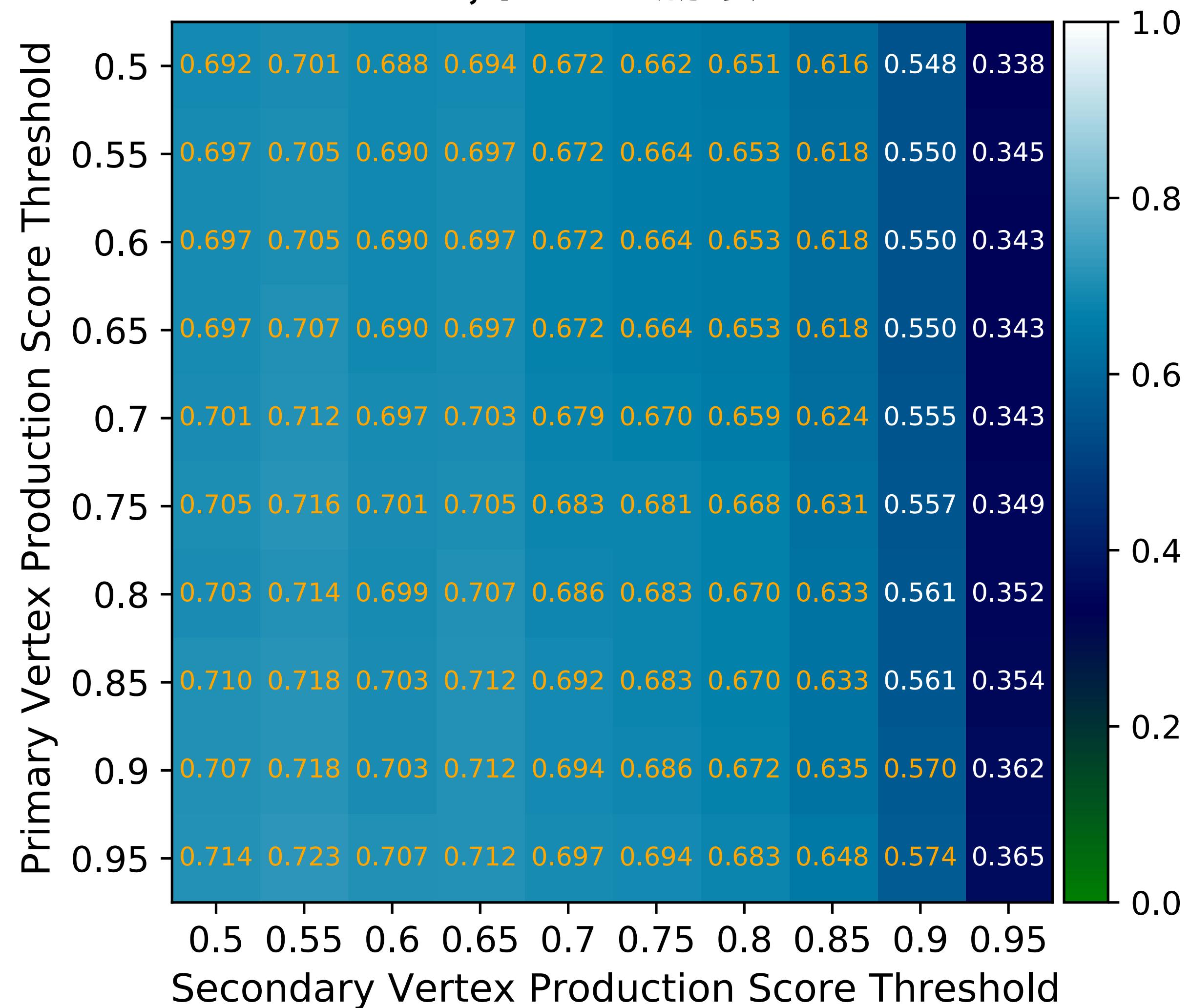
Bottom



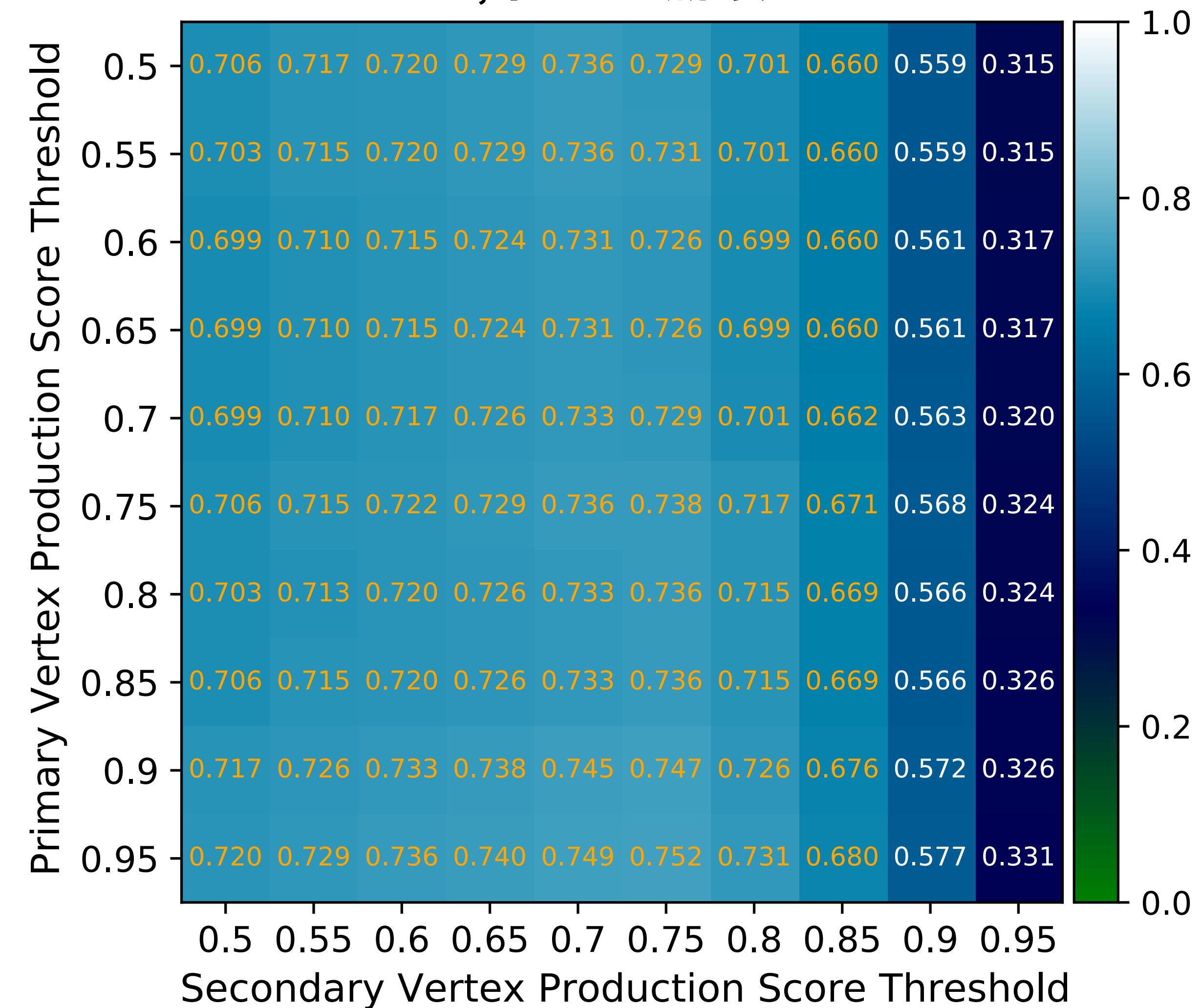
Charm



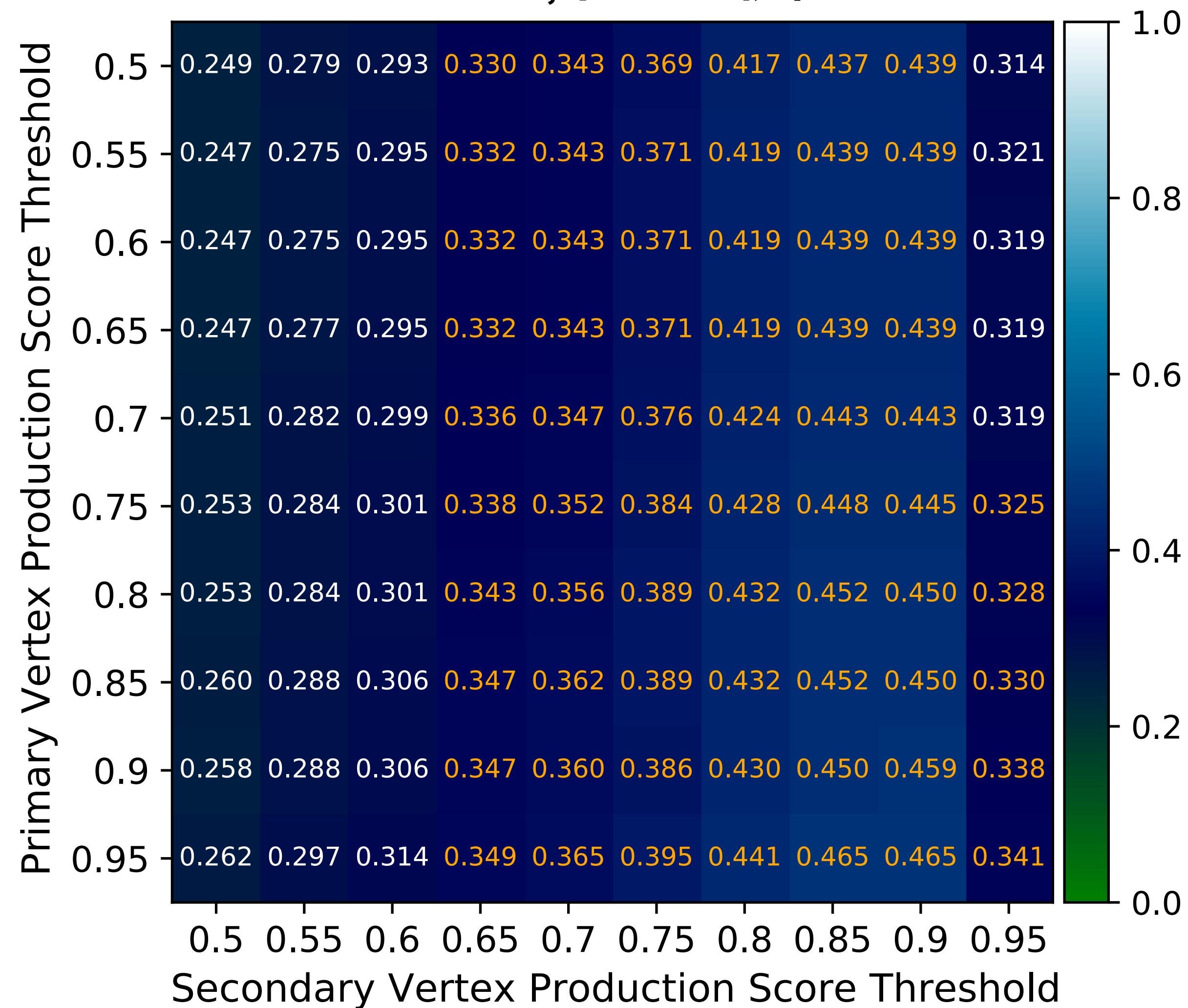
Bottom, 同一の崩壊チェイン



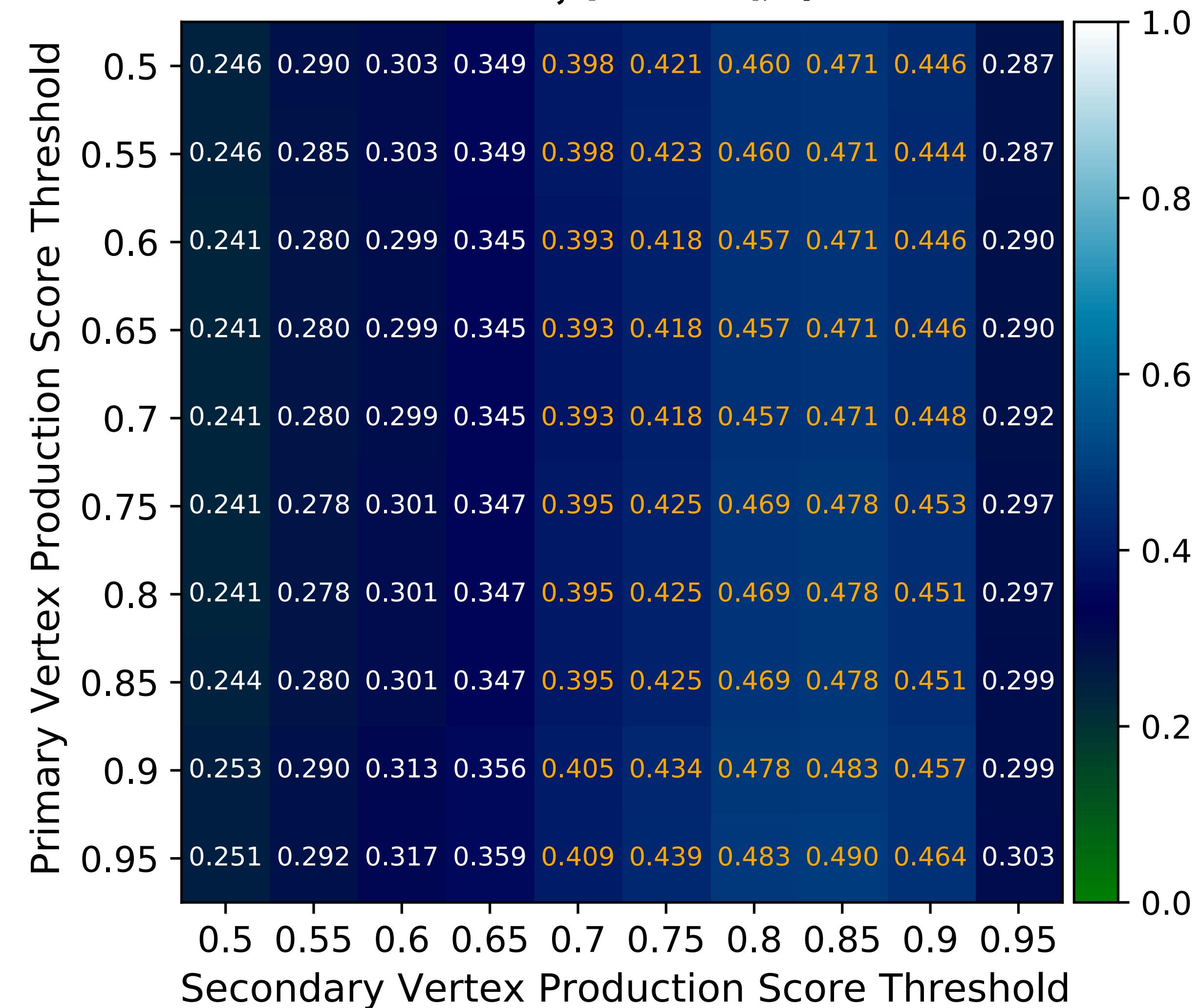
Charm, 同一の崩壊チェイン

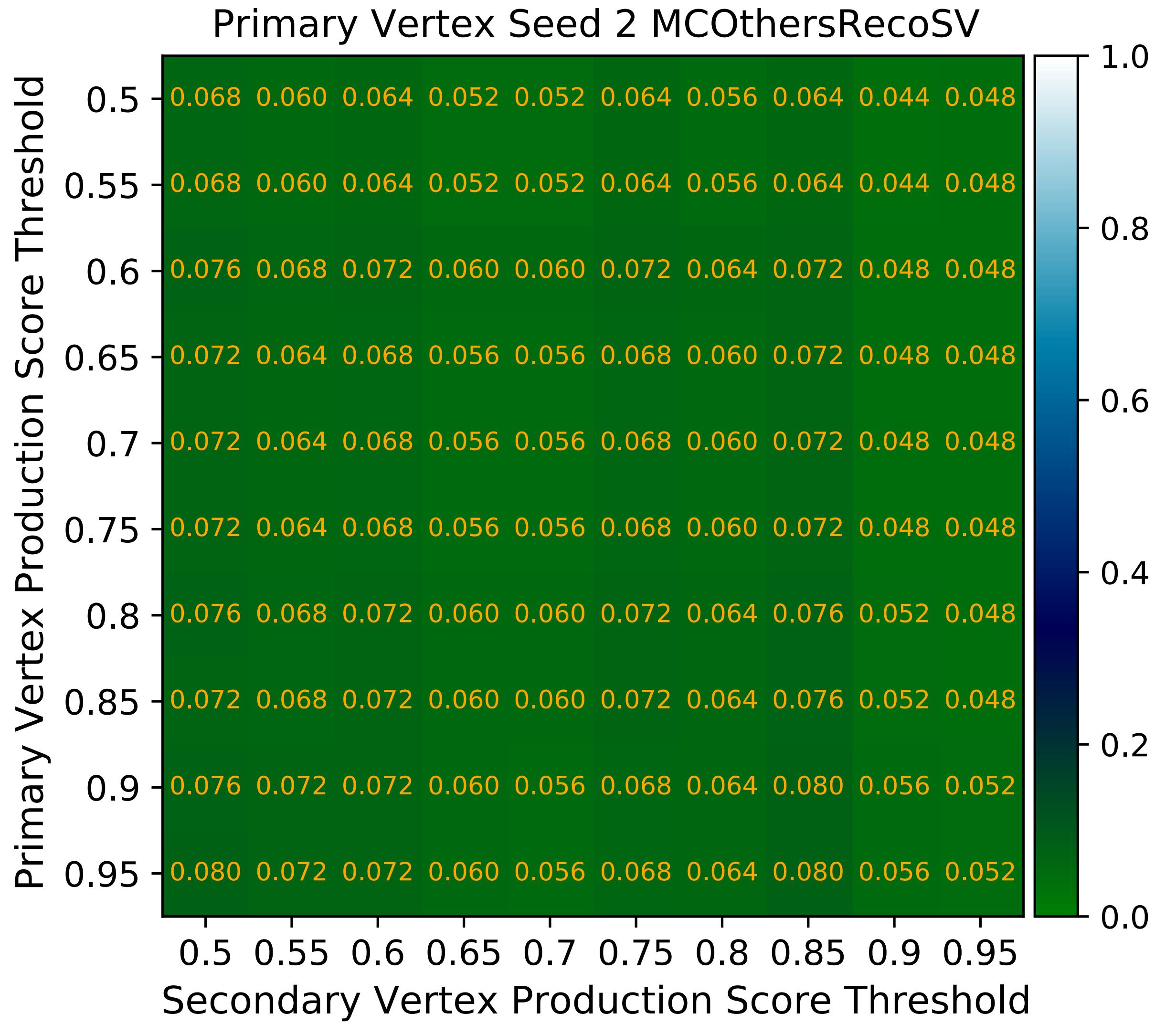
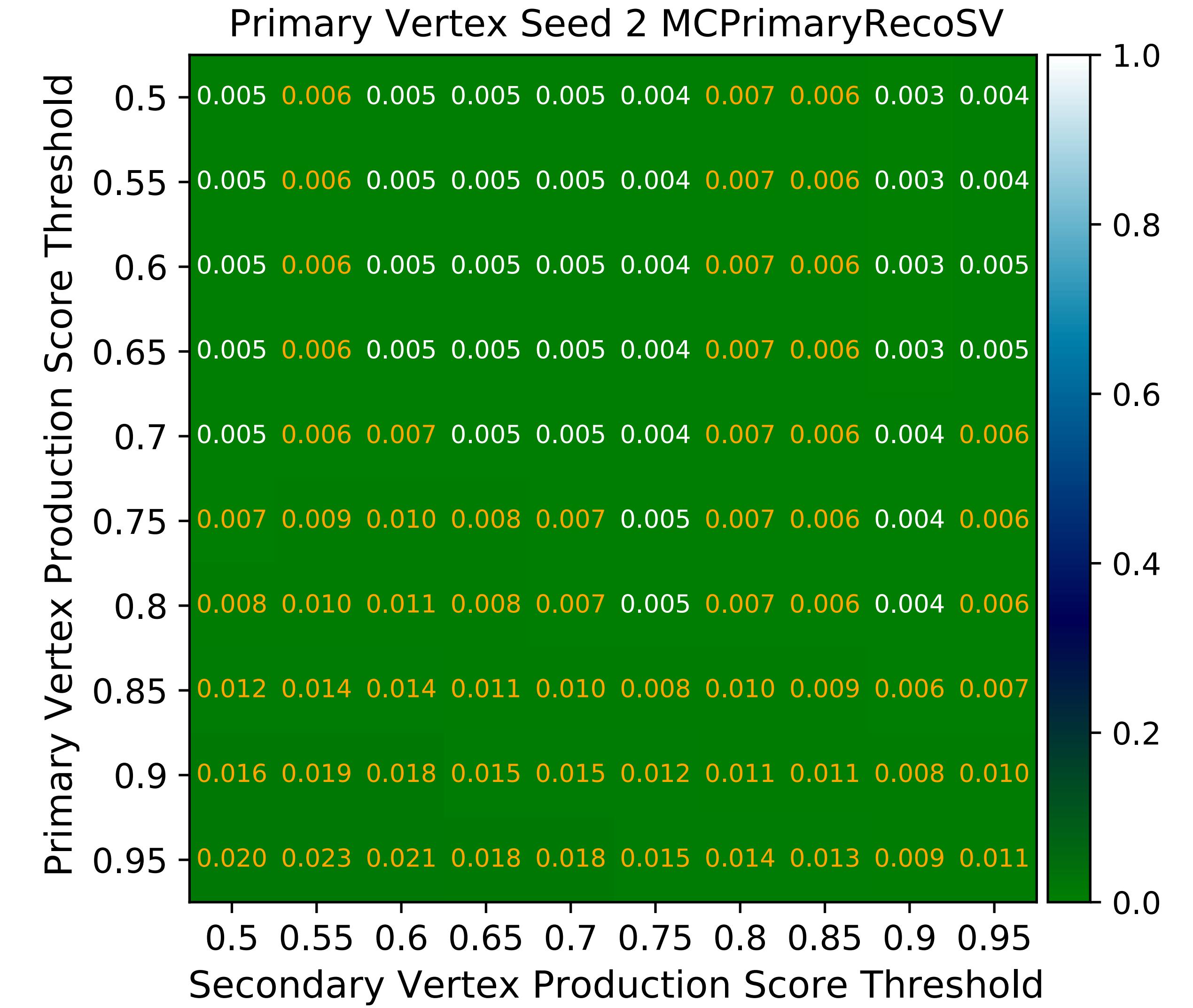


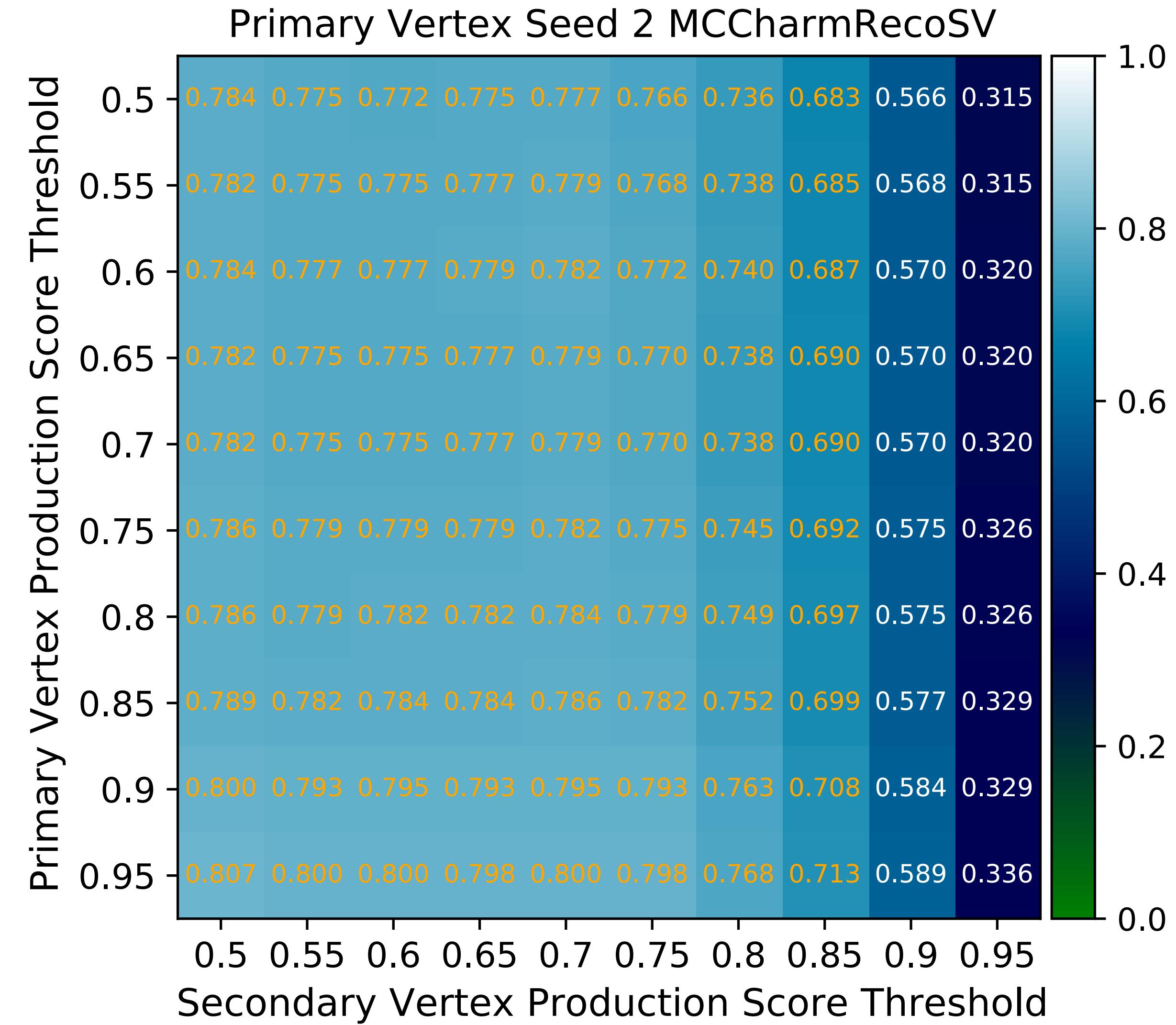
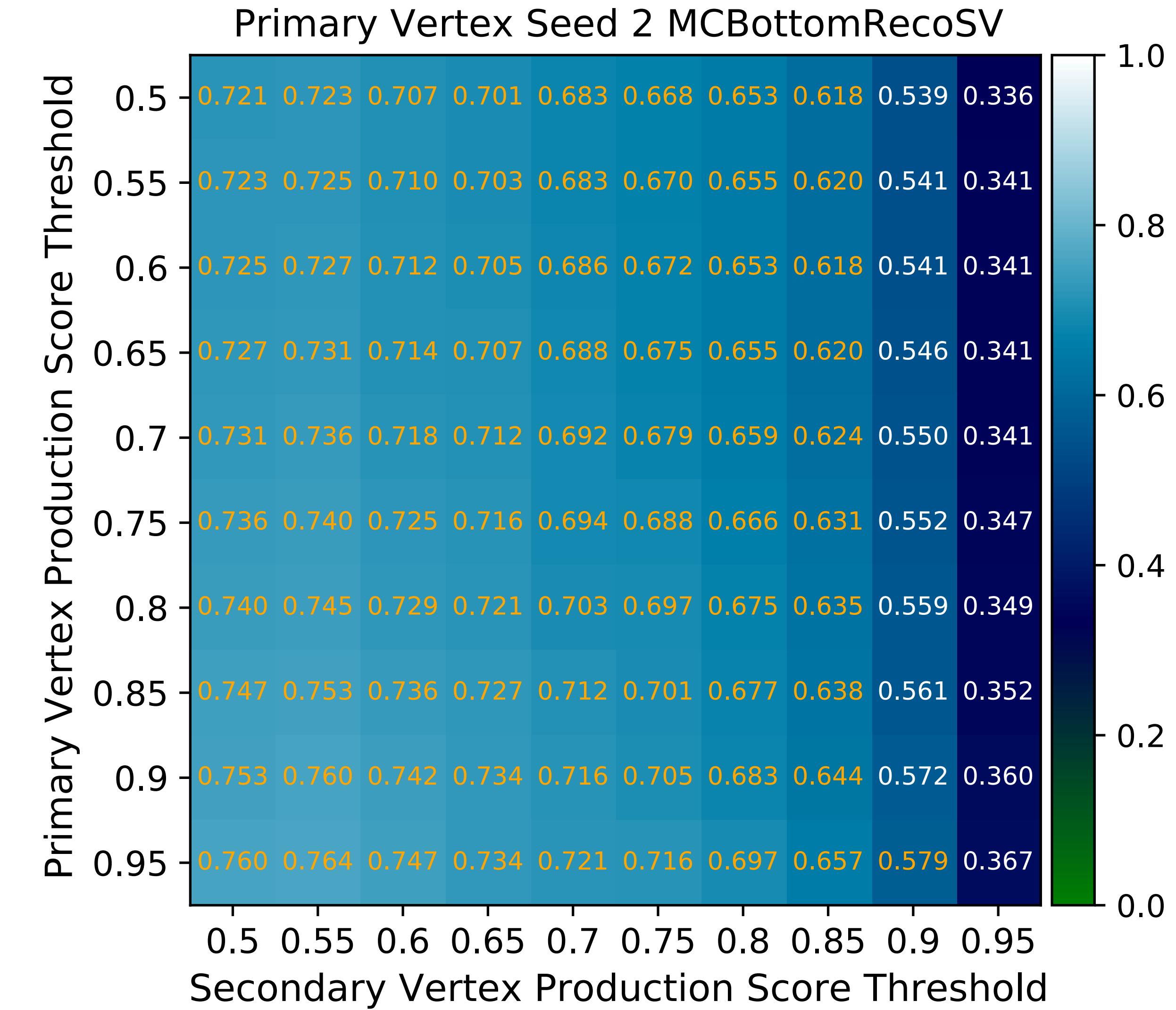
Bottom, 同一の親粒子

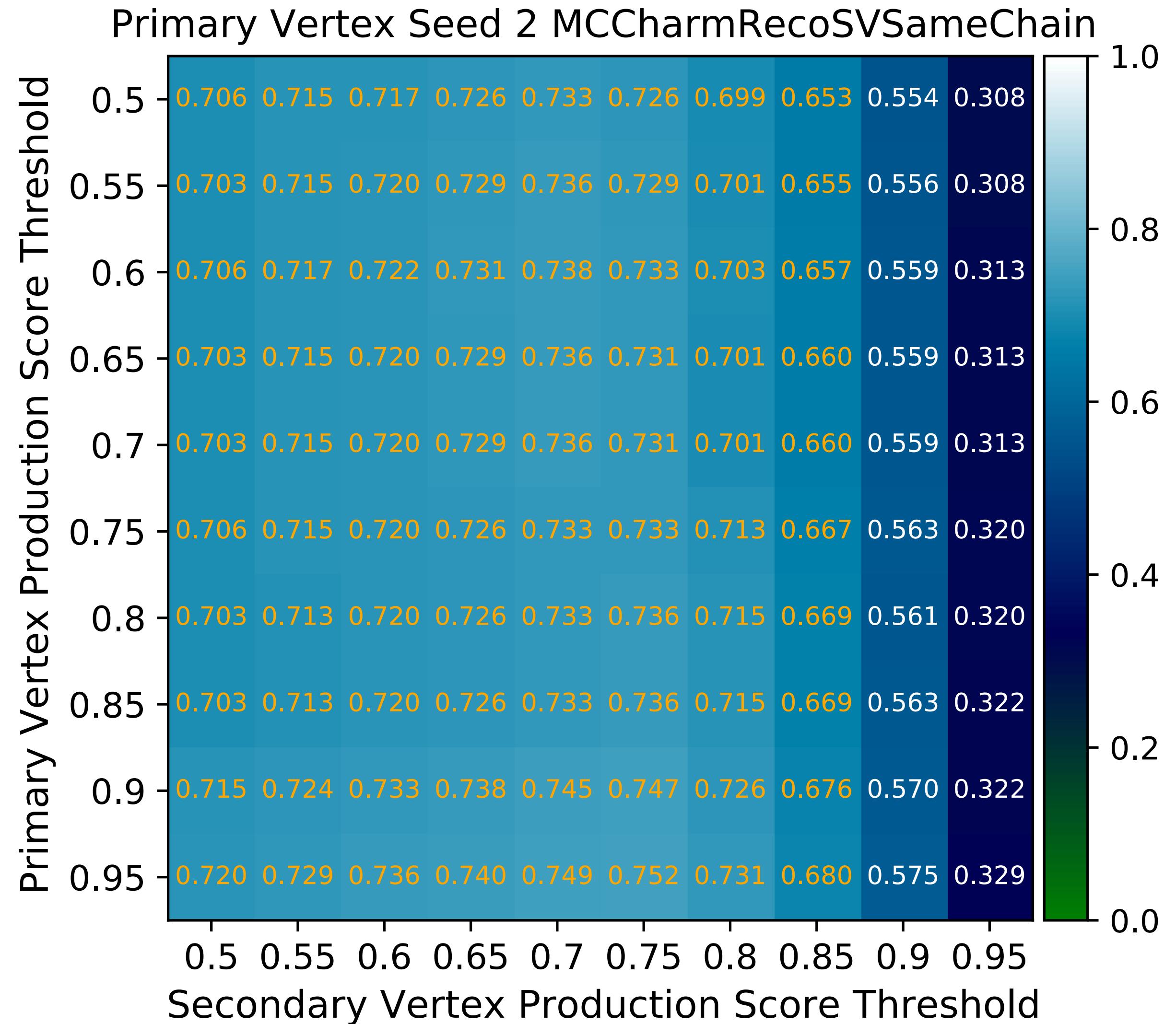
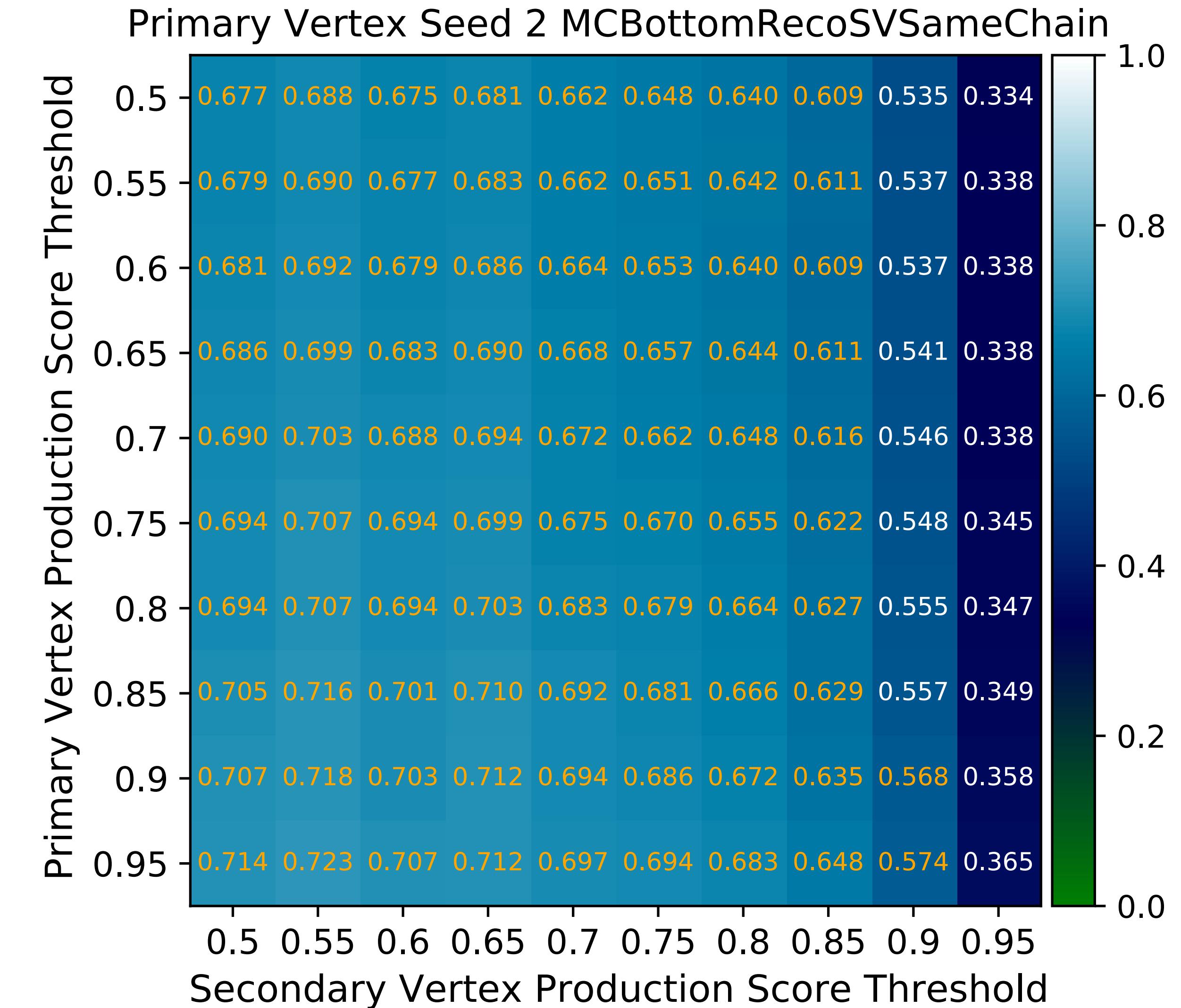


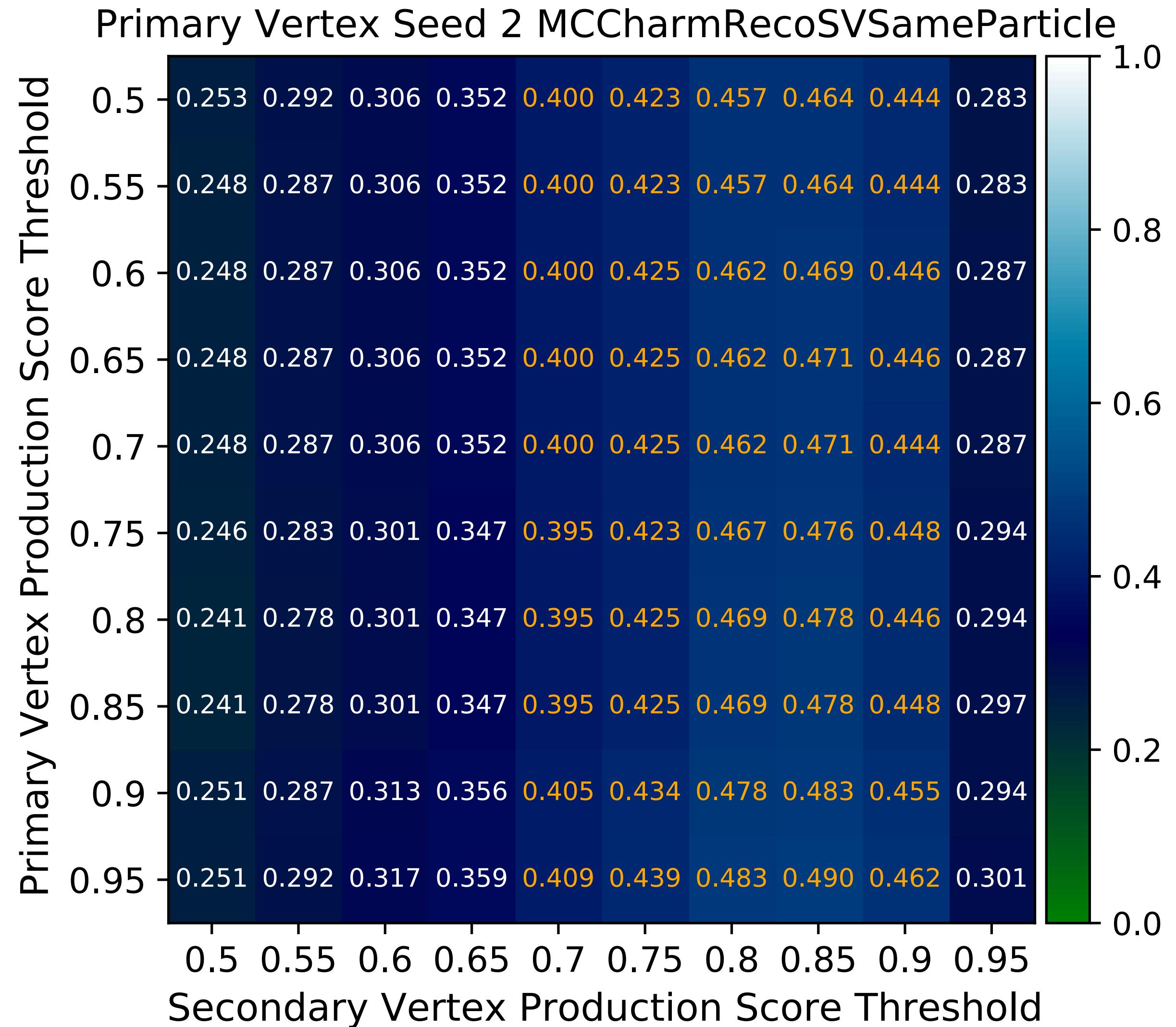
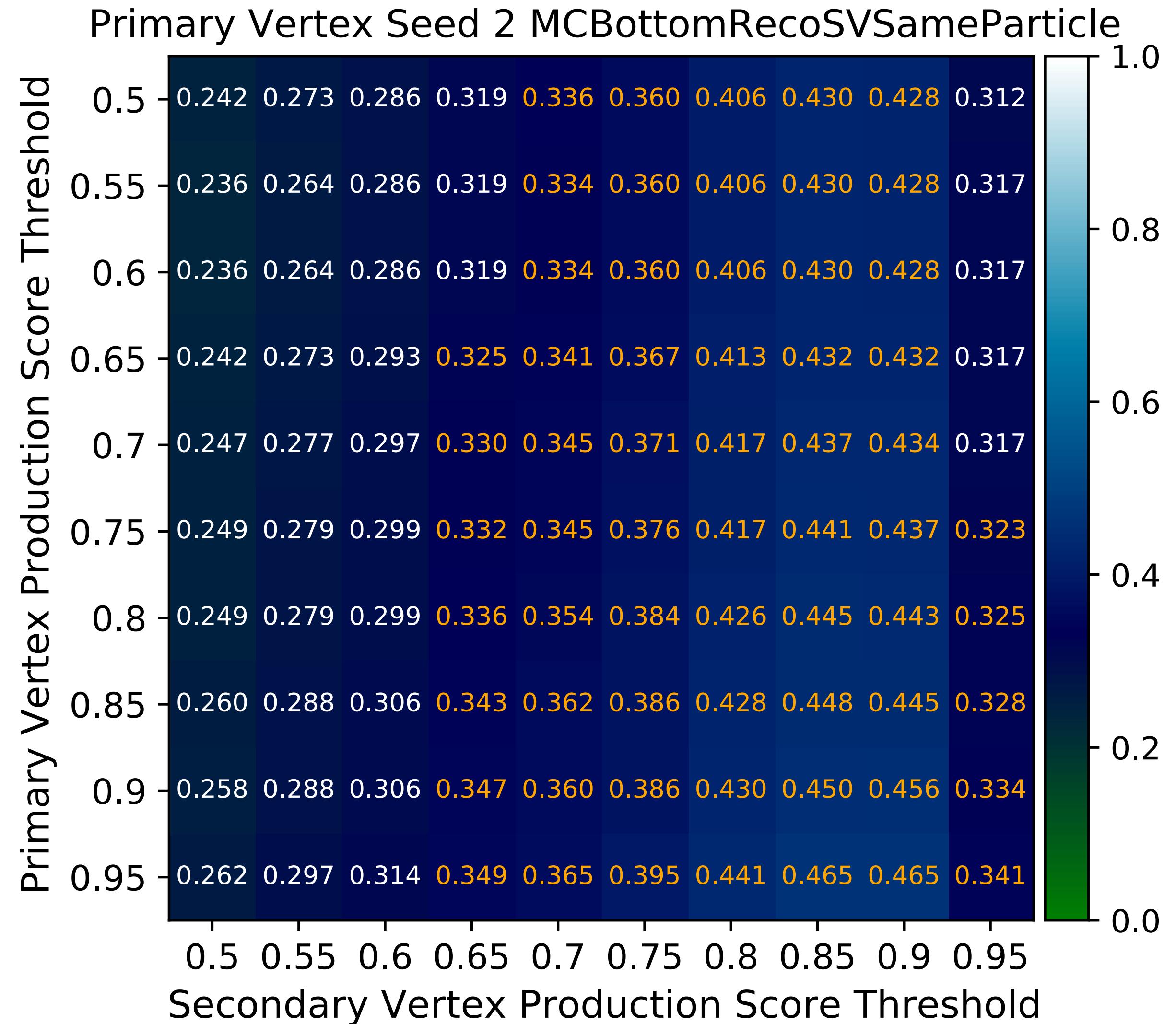
Charm, 同一の親粒子

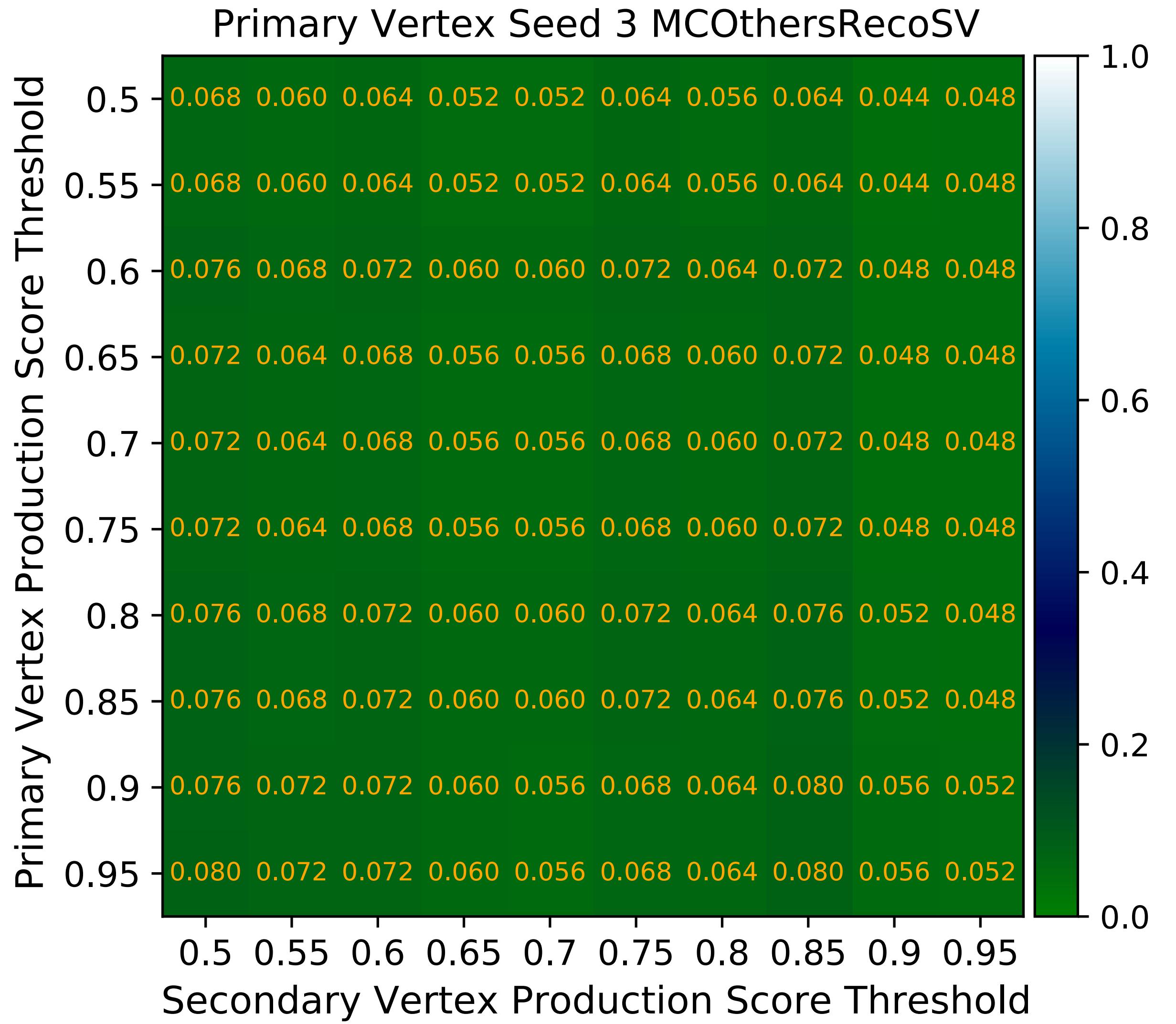
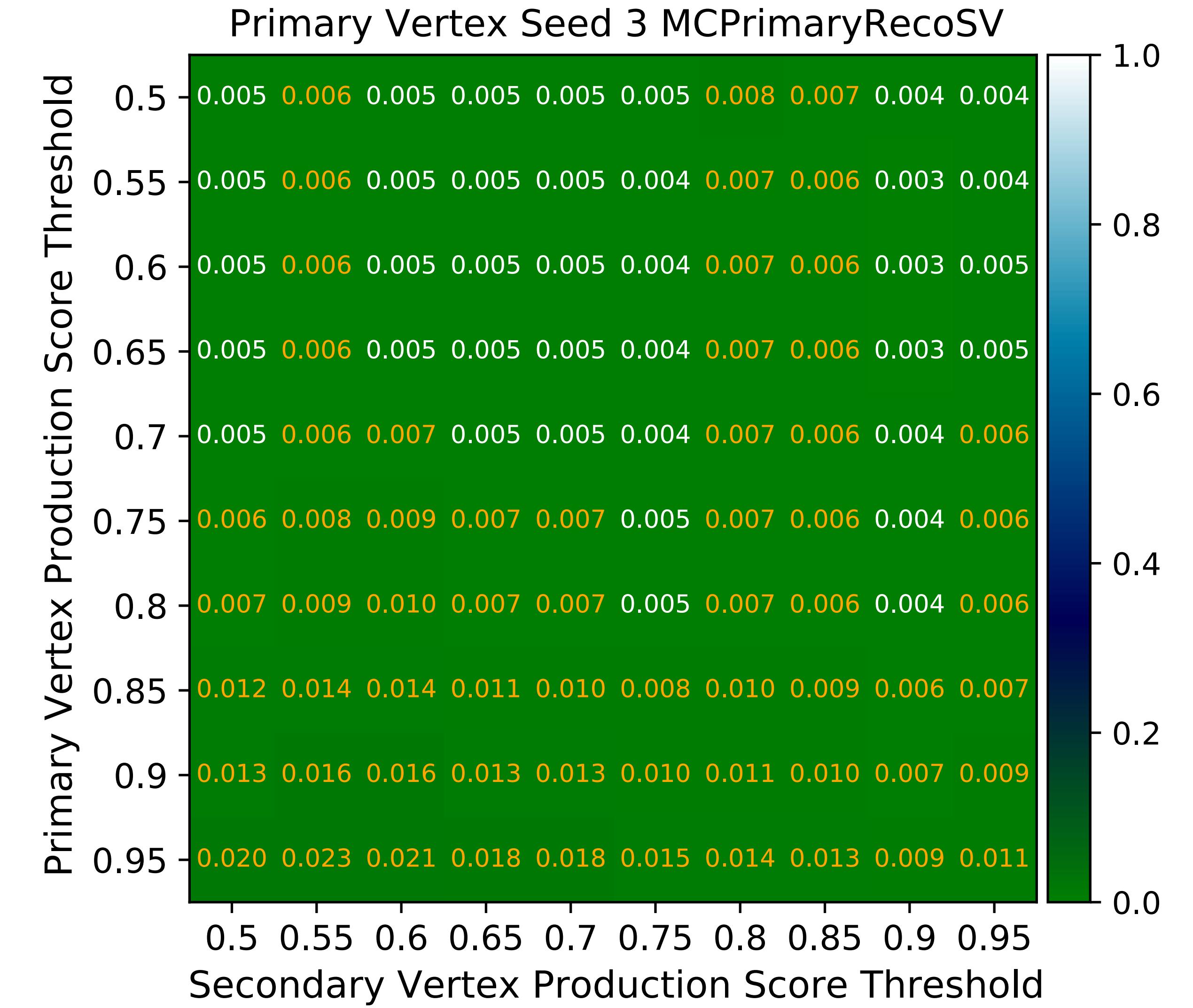


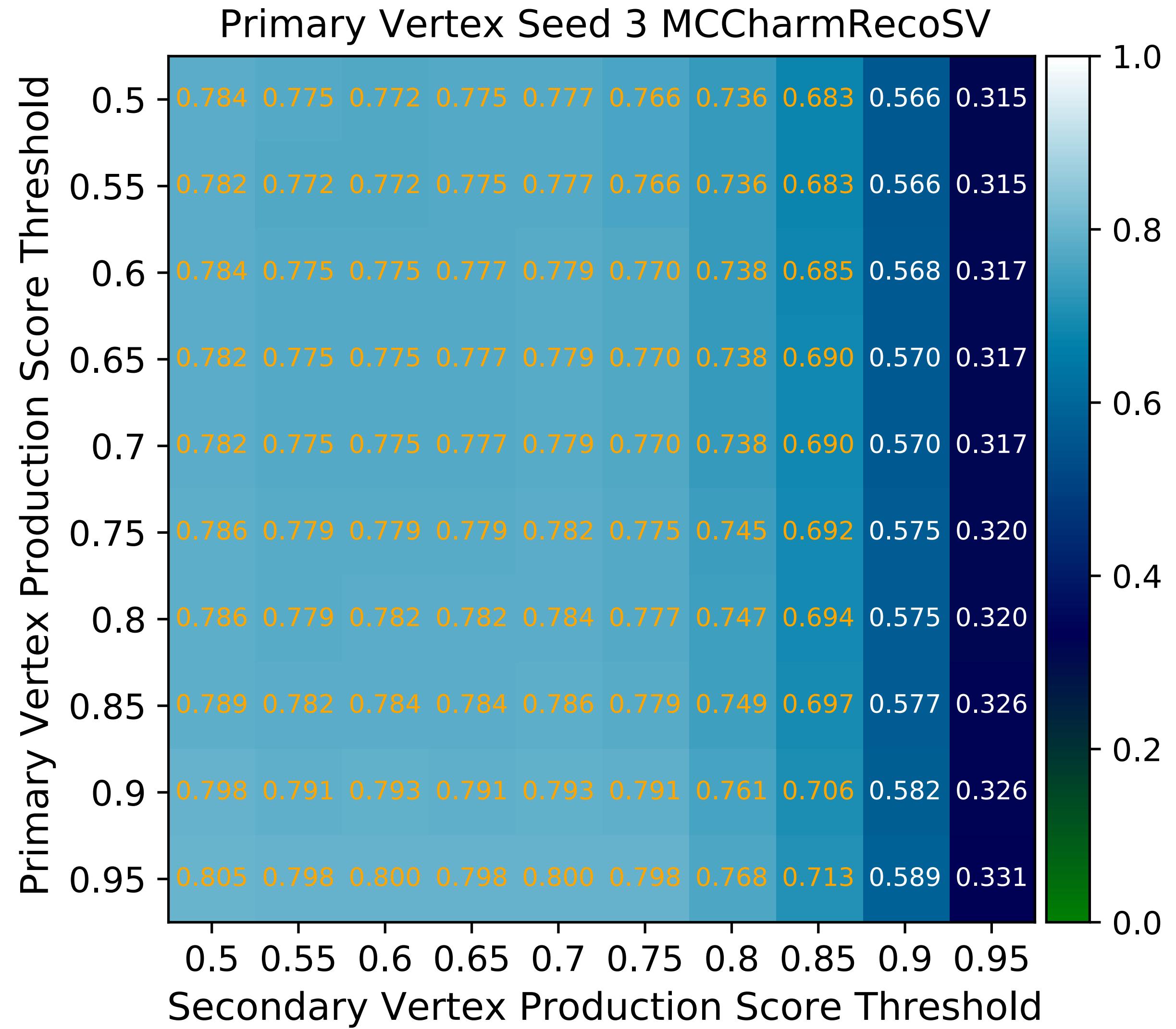
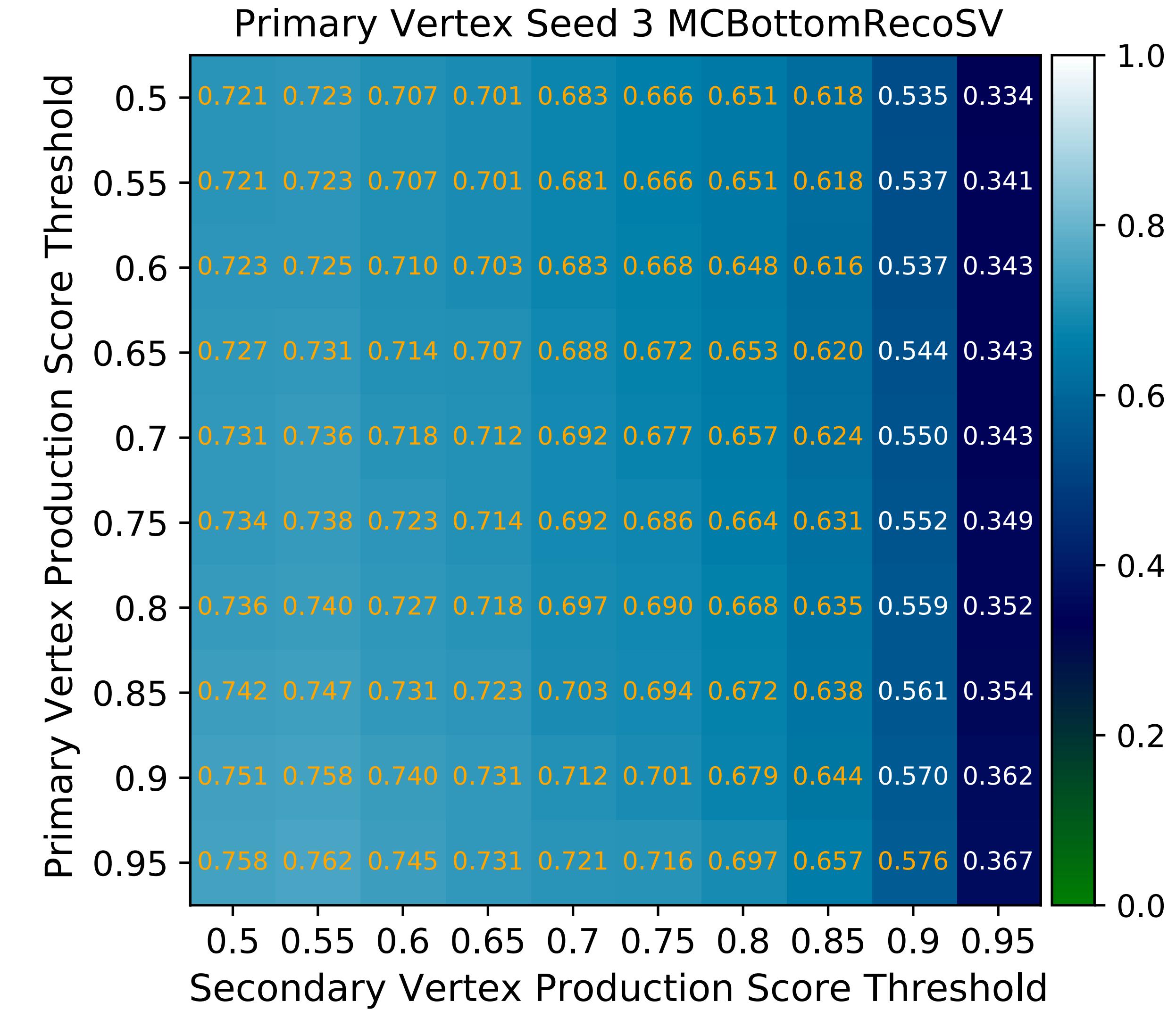


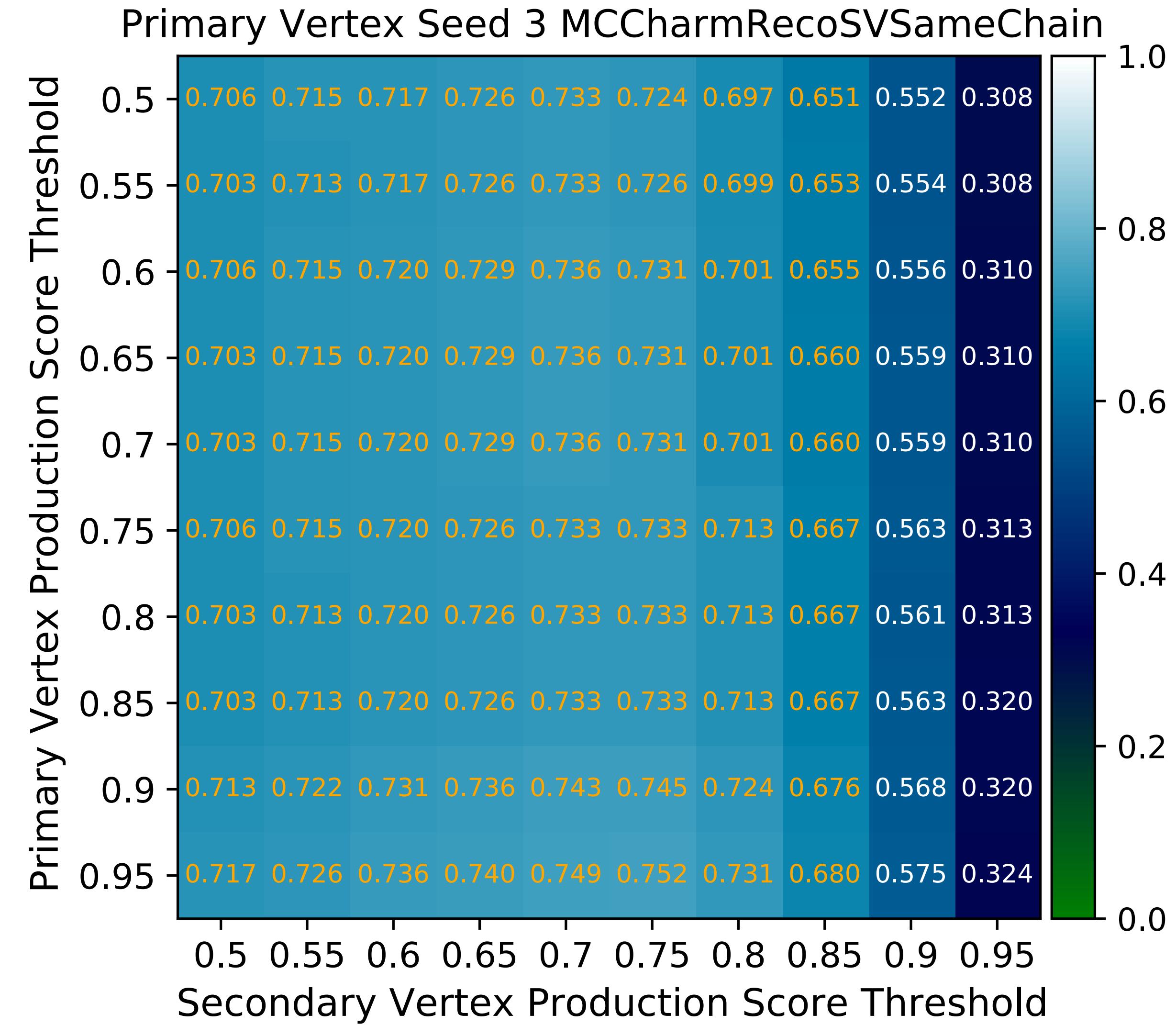
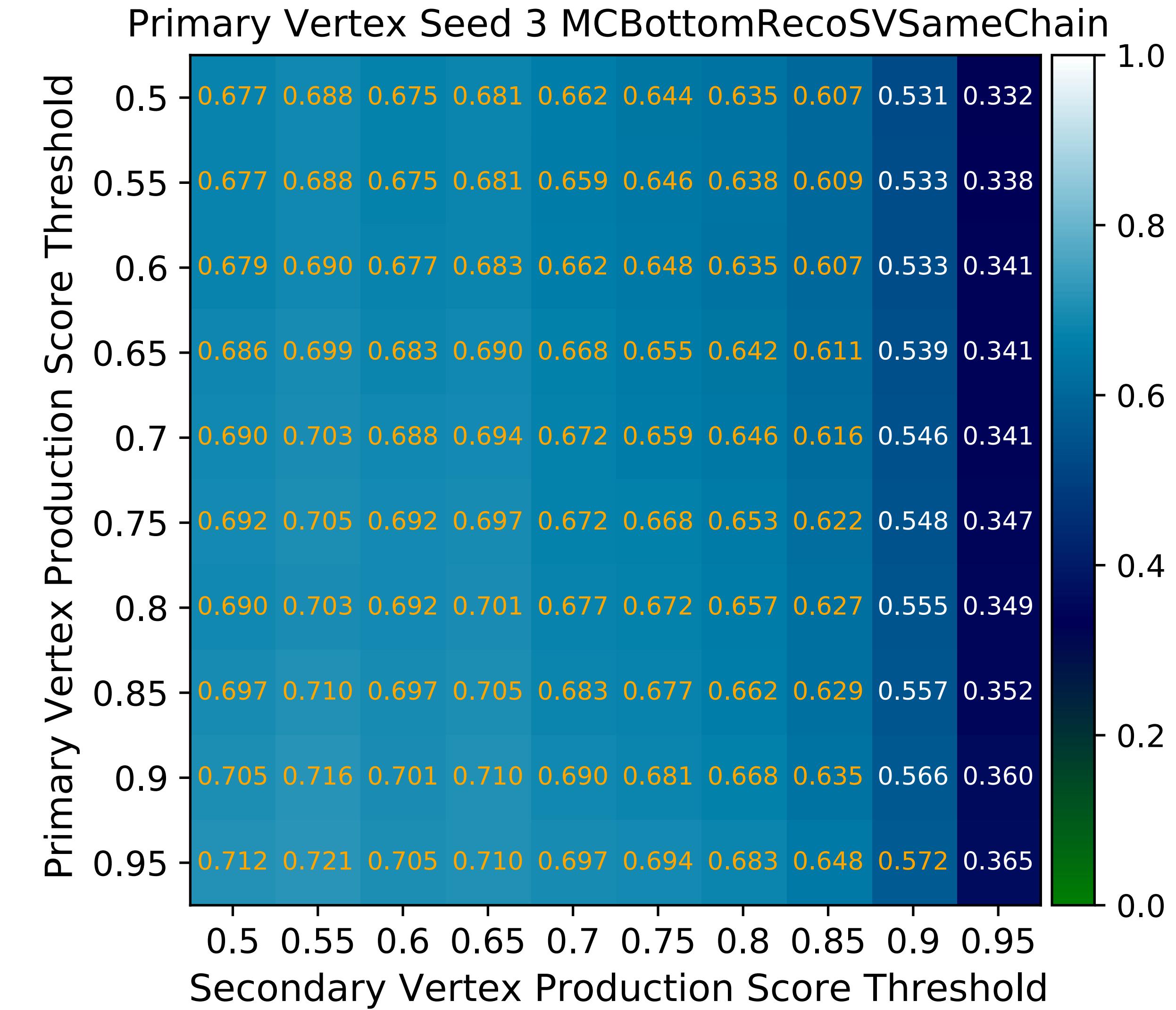


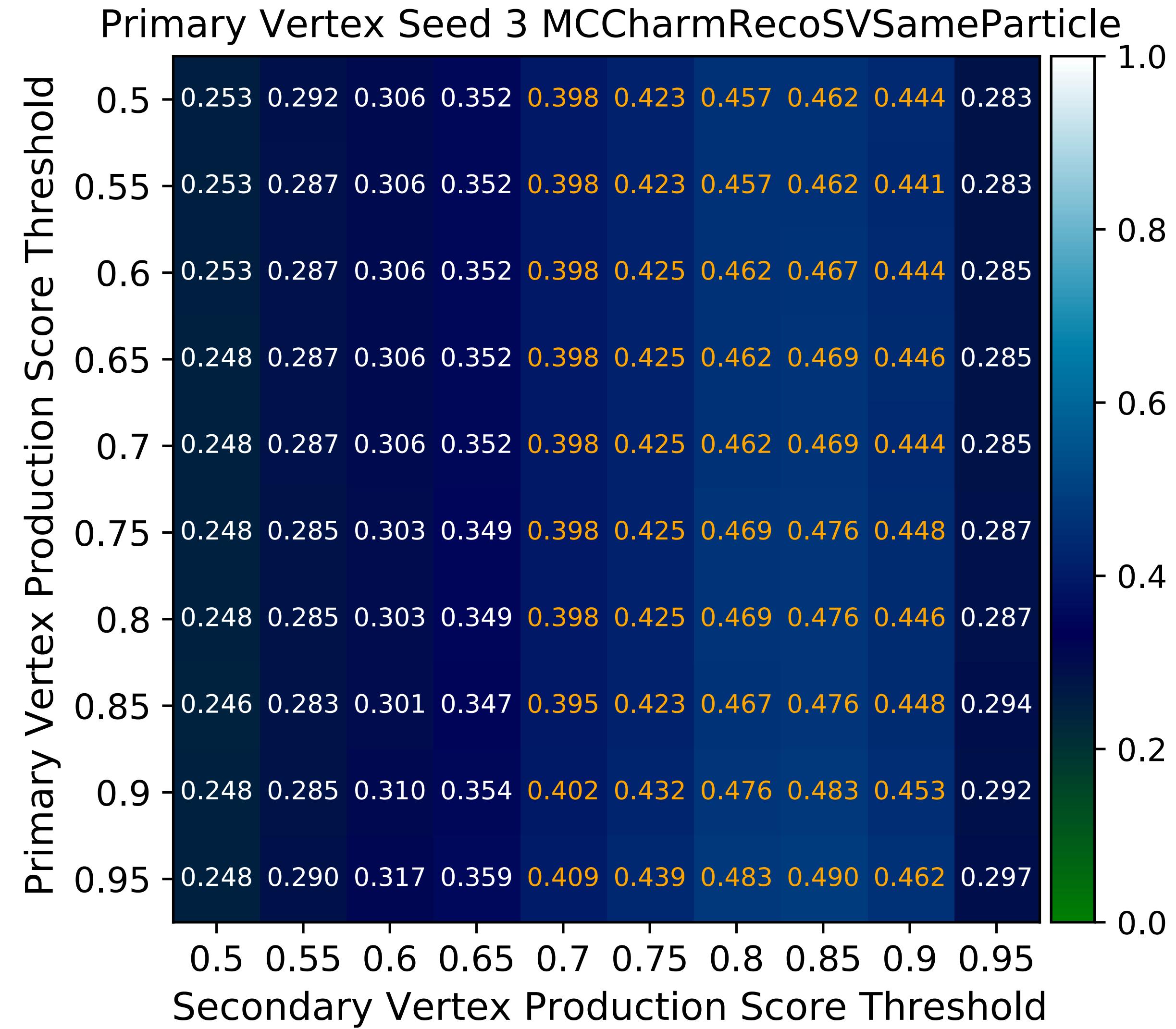
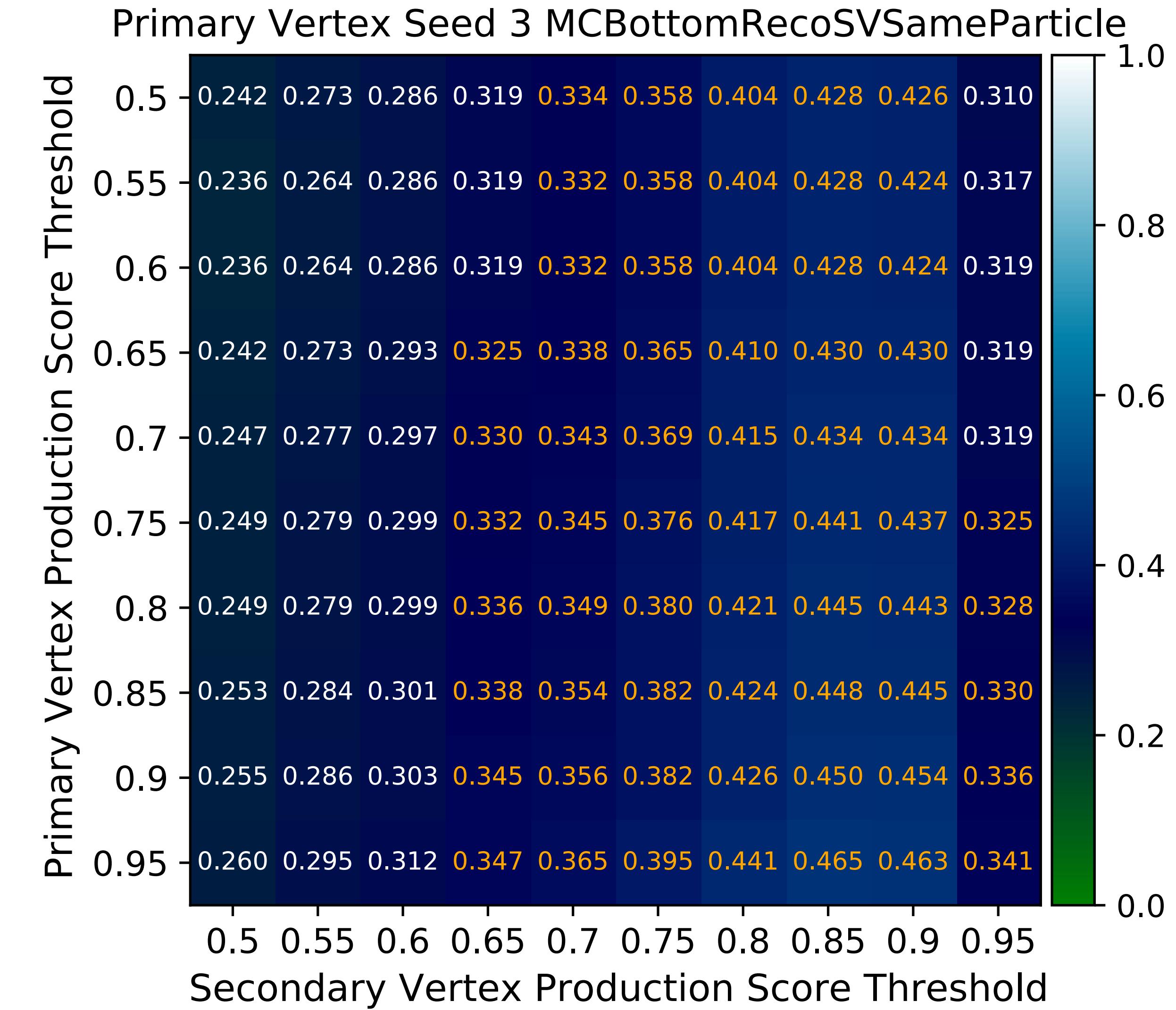




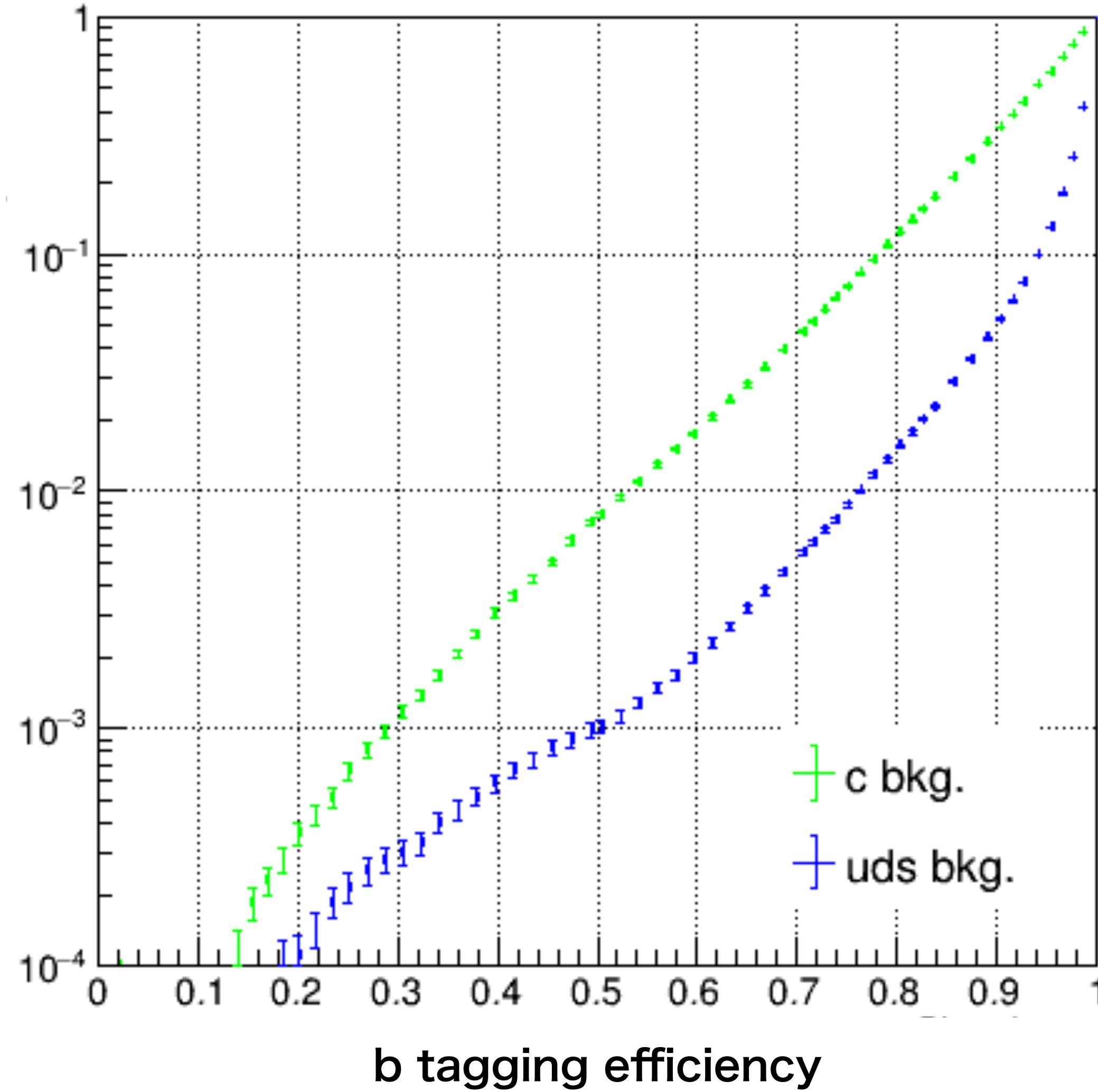




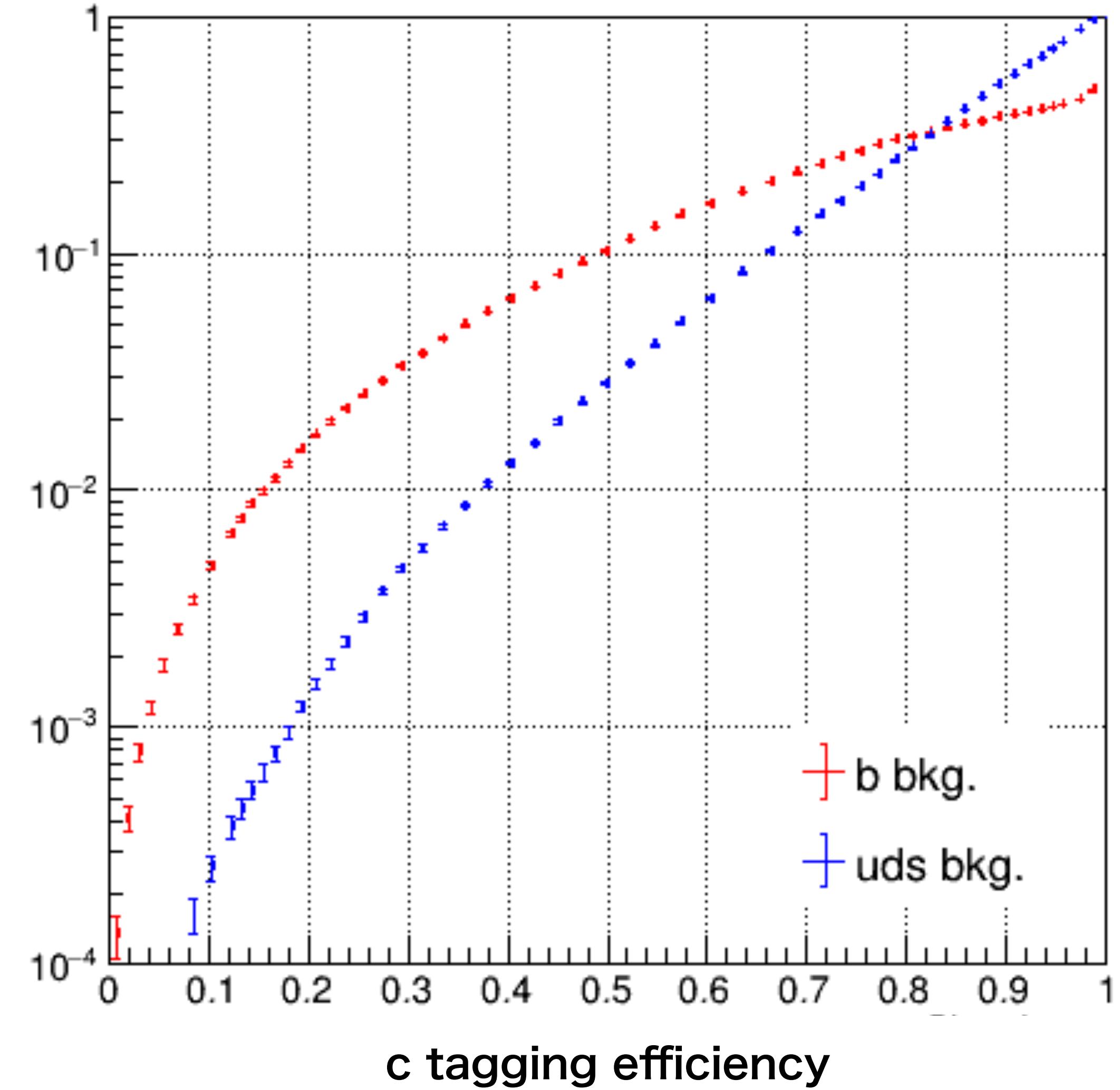


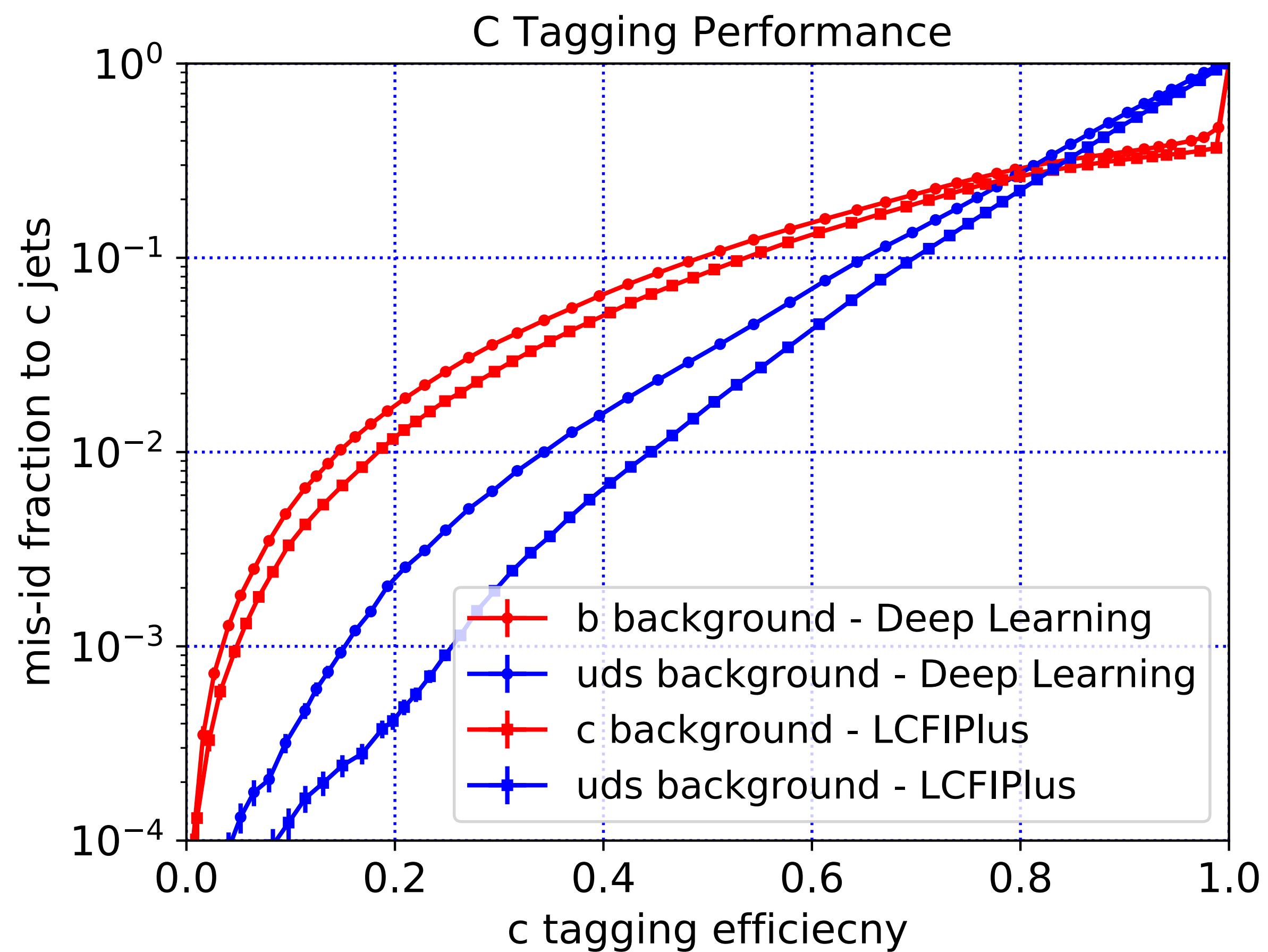
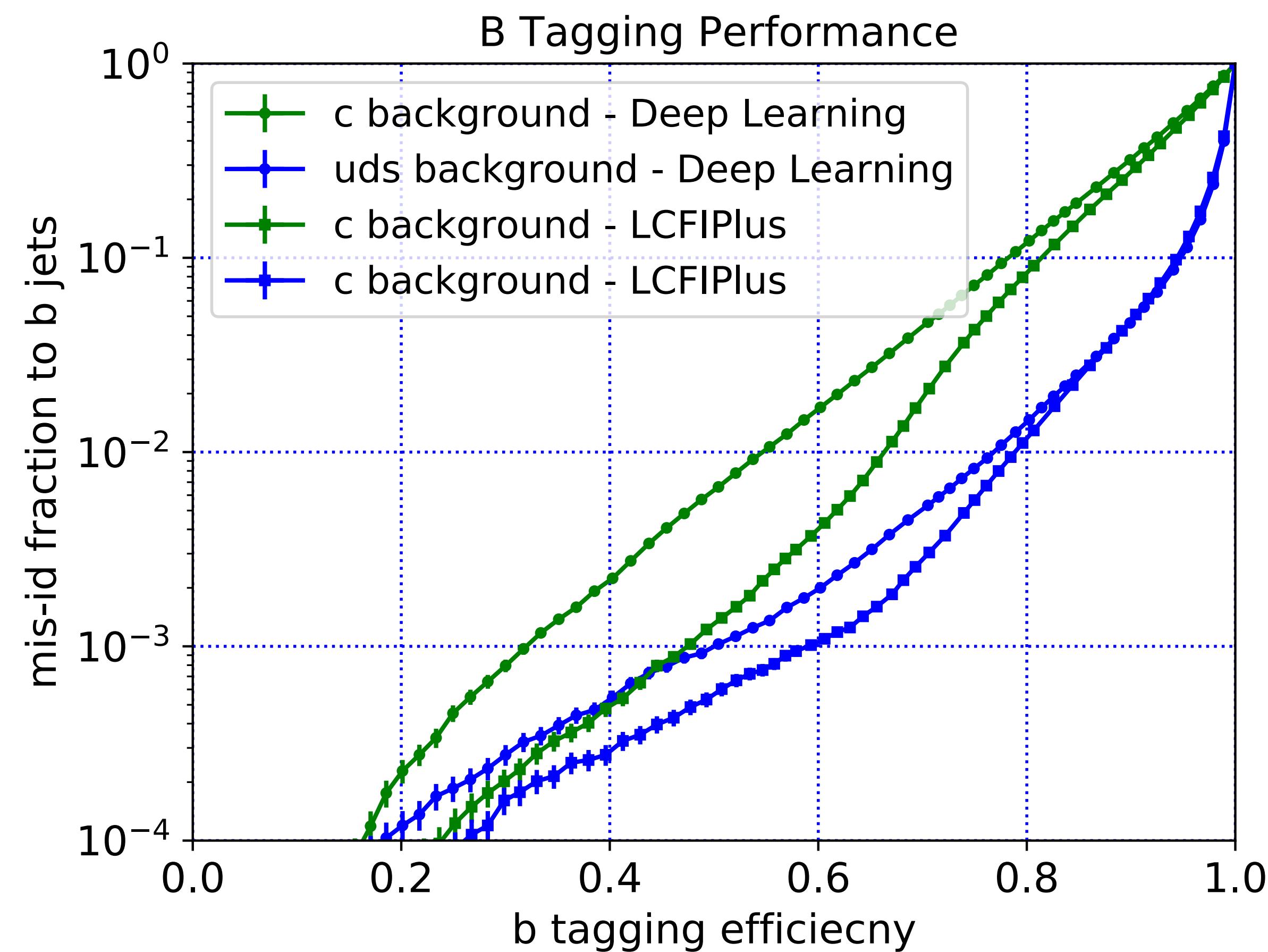


BG efficiency

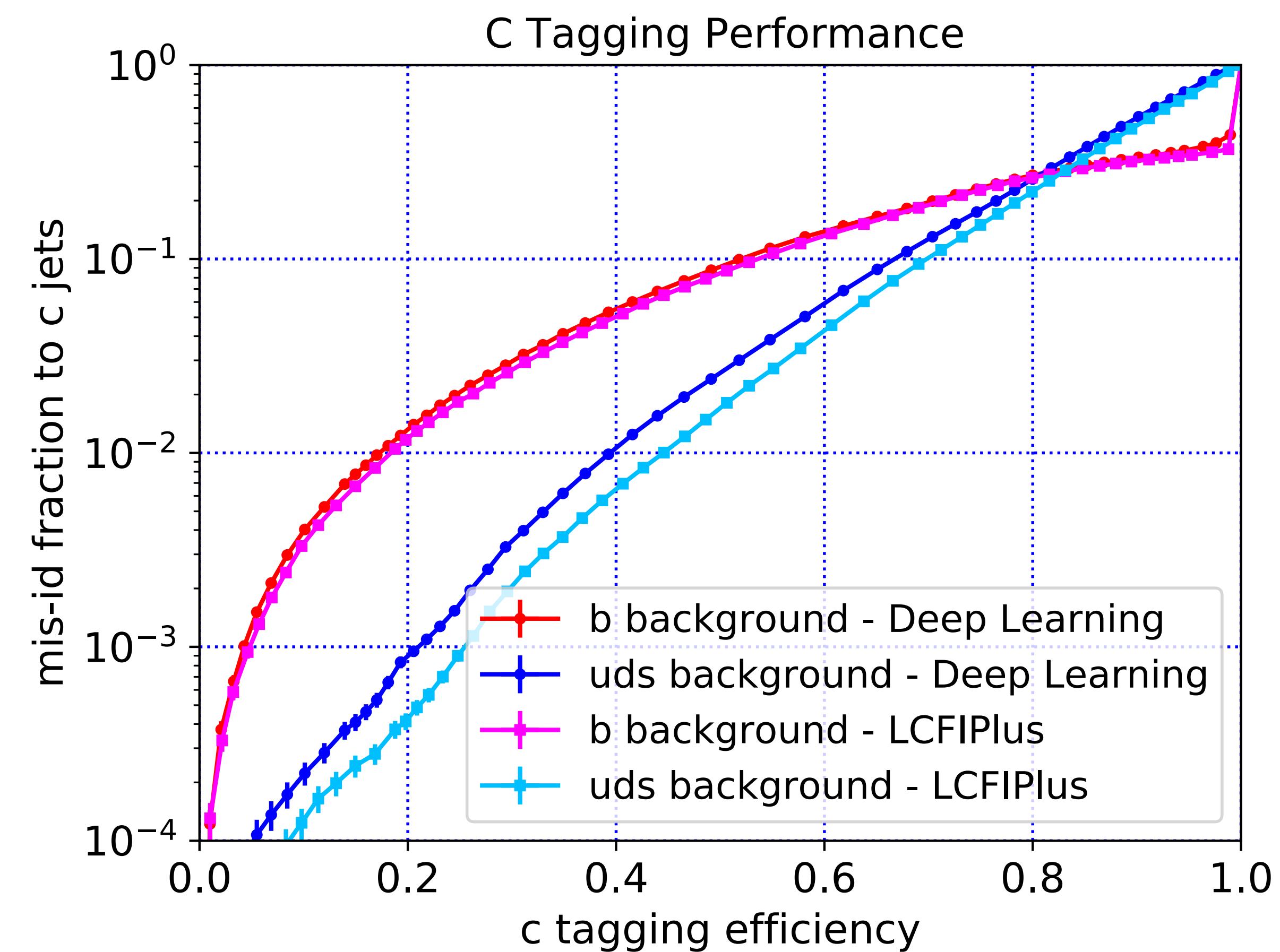
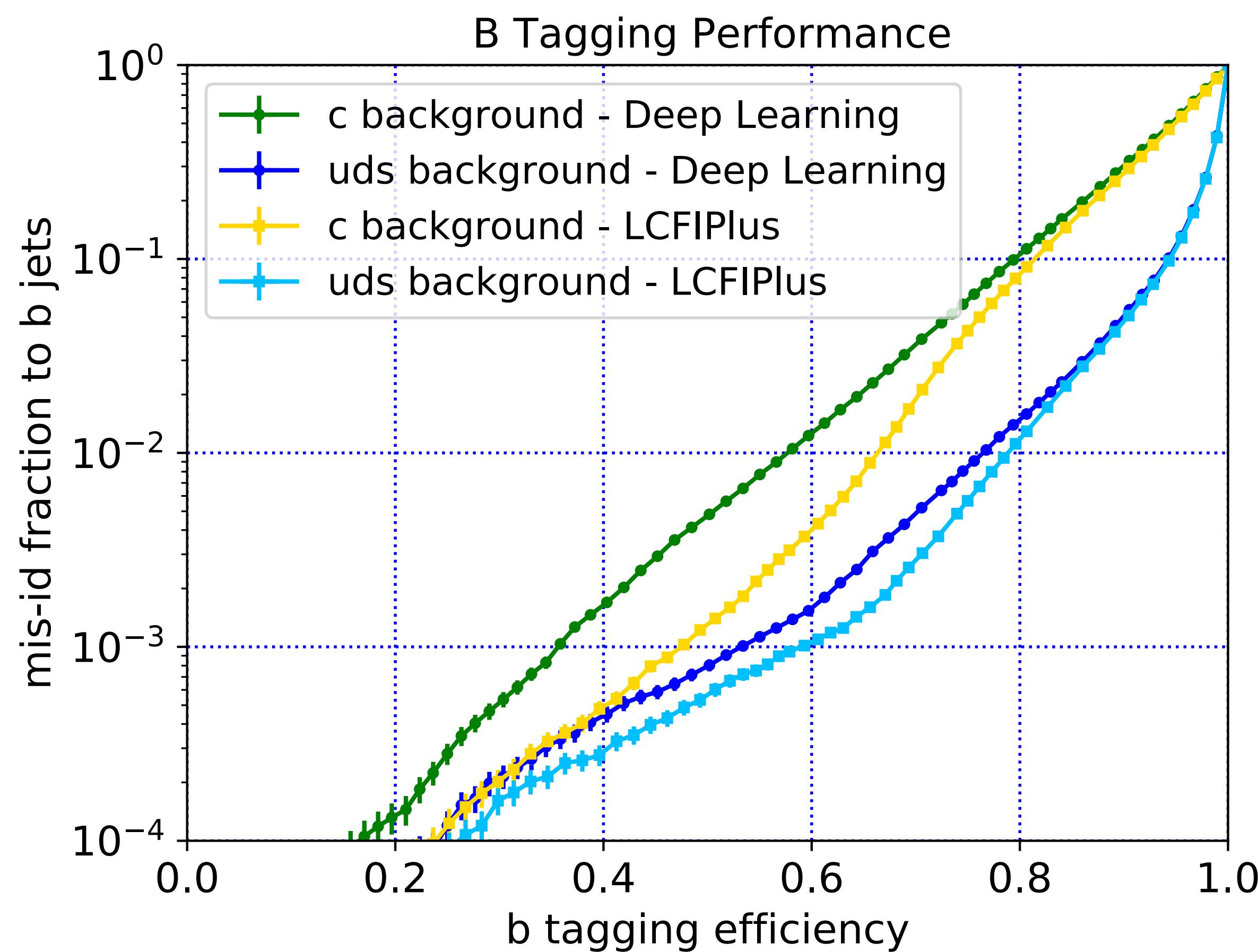


BG efficiency

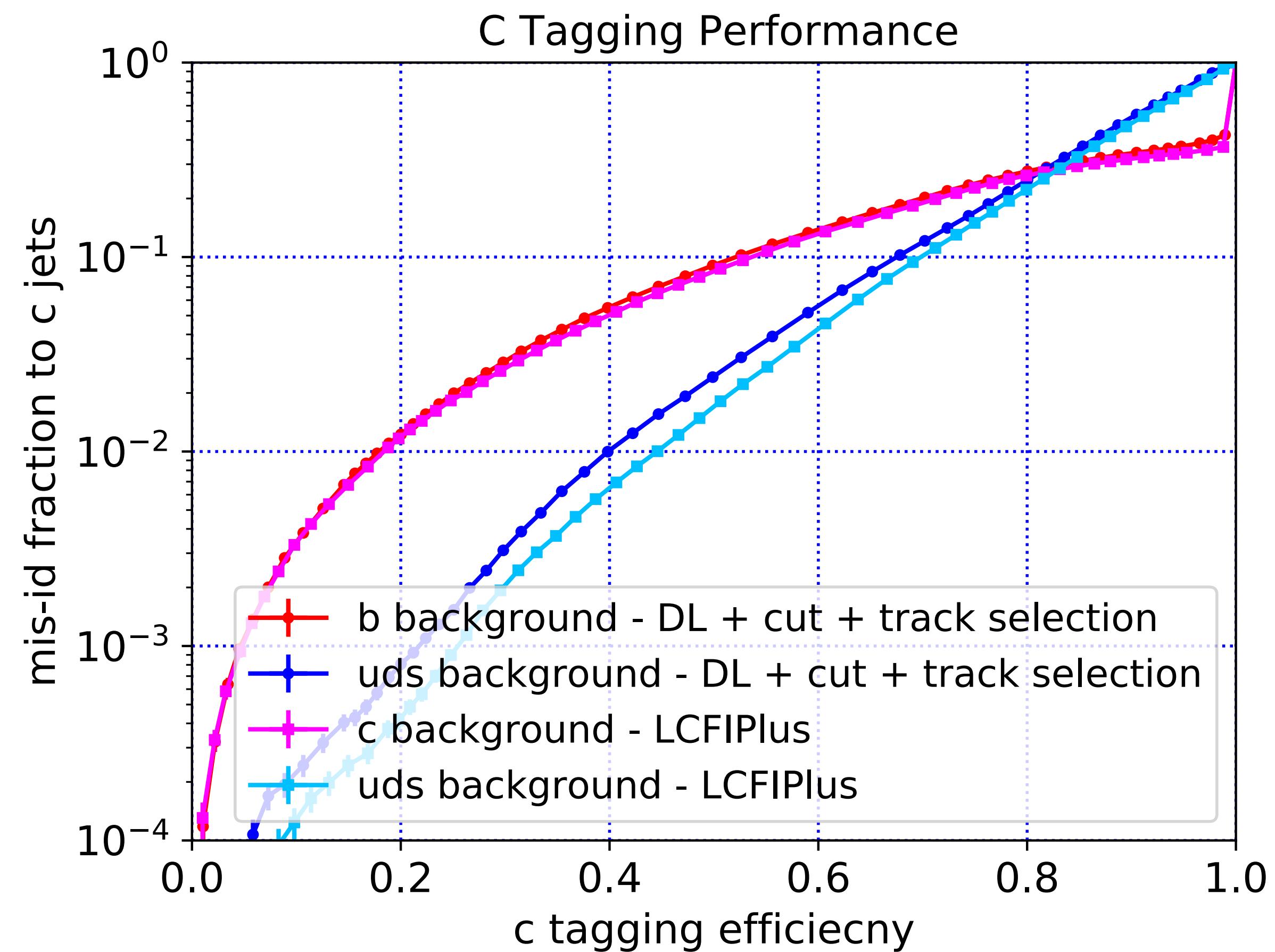
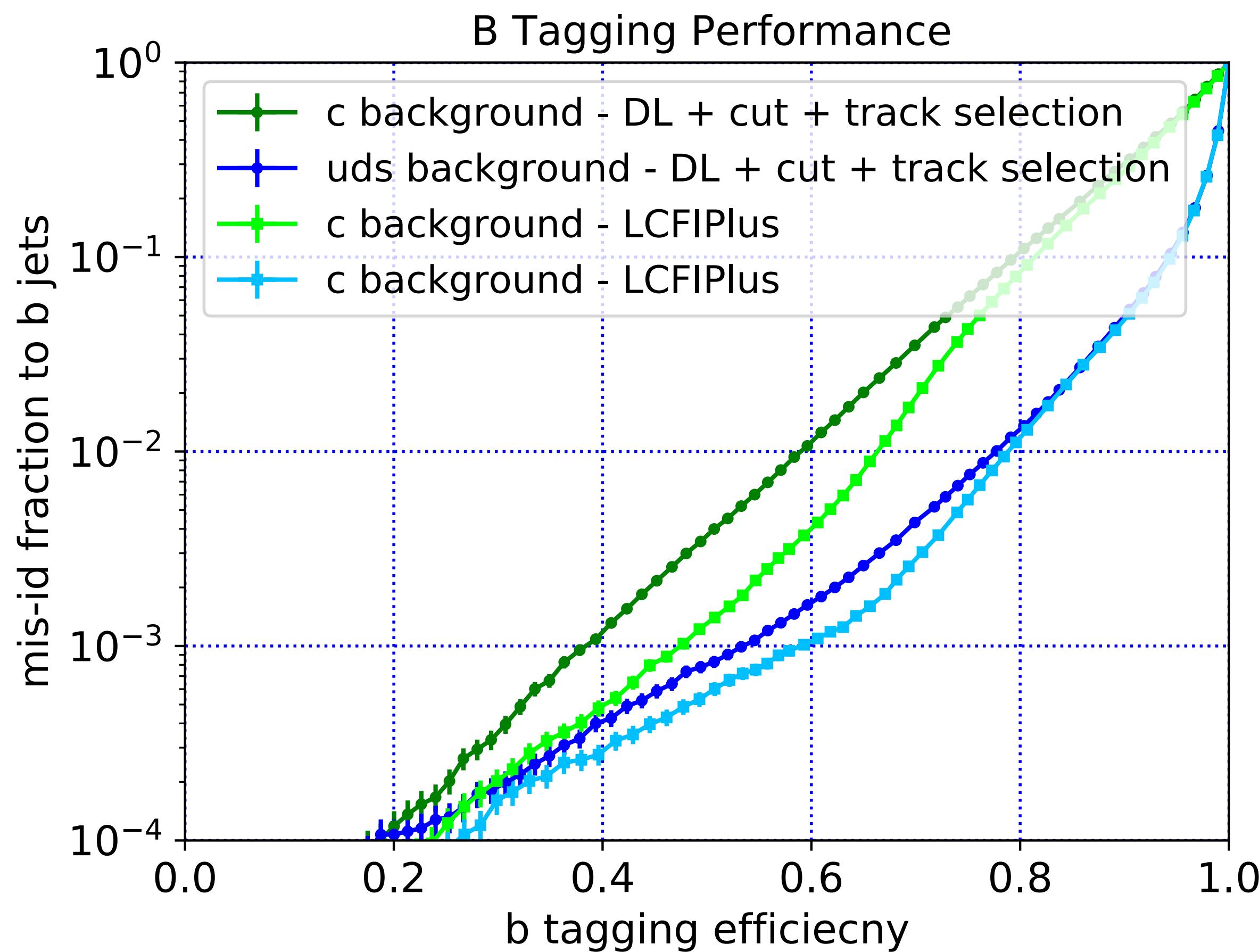




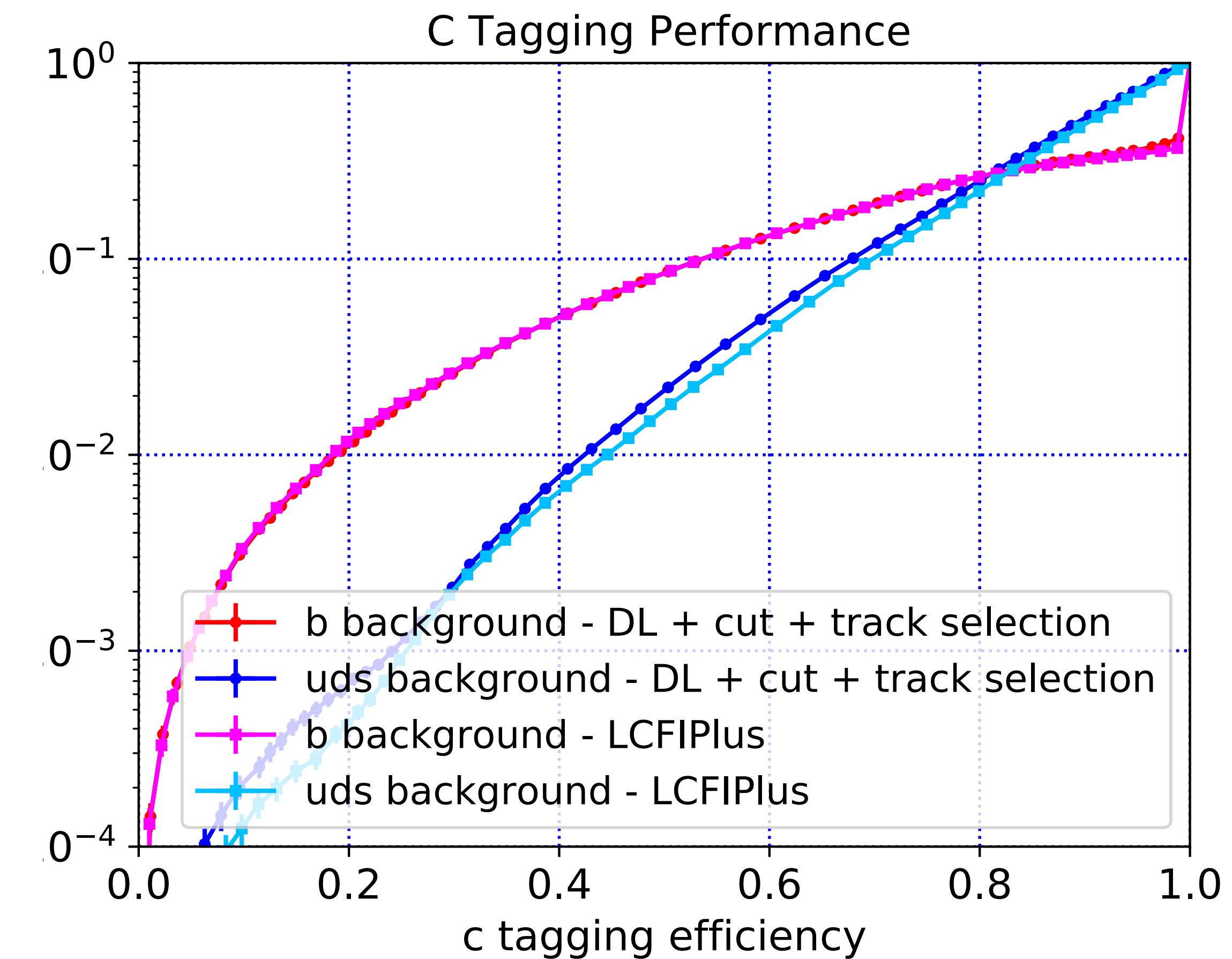
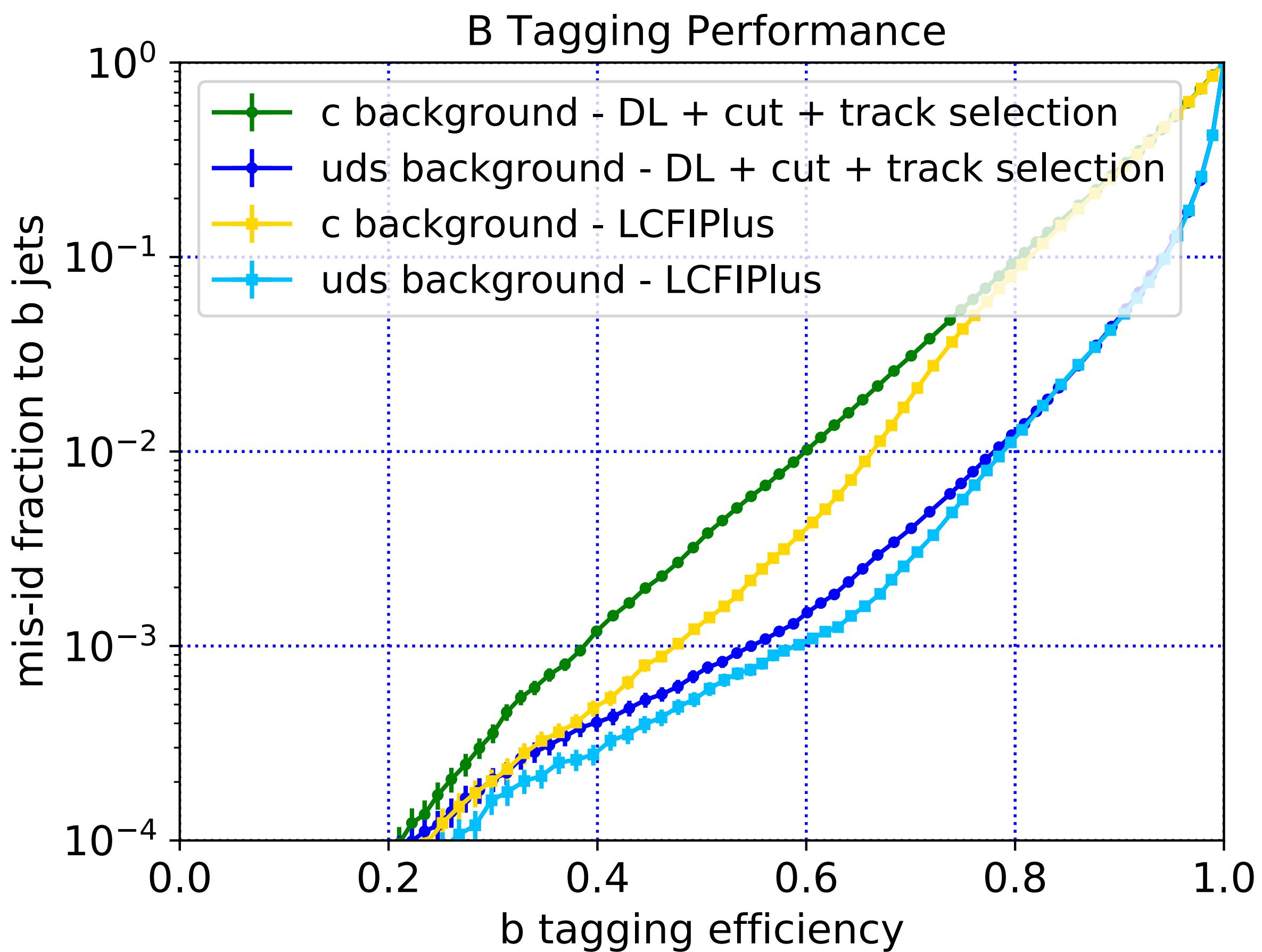
MTFIG1



MT5075



MT5050



MT7550

