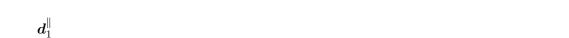
## $arc\ tangent$

## $beam\ tangent$

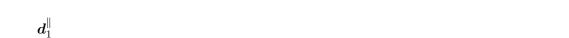




























$$d\theta = \kappa ds$$

$$d\theta_1 = \kappa_1 ds$$

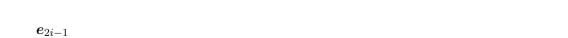
$$d\theta_2 = \kappa_2 ds$$

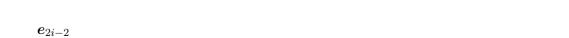
$$d\theta_3 = \tau ds$$

















 $\boldsymbol{e}_{i-1}$ 



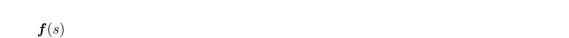












## ghost

## handle

$$\kappa_1 oldsymbol{d}_1$$

$$\kappa_2 oldsymbol{d}_2$$

 $\kappa b$ 

$$oldsymbol{\kappa}oldsymbol{b}_0$$

 $oldsymbol{\kappa}oldsymbol{b}_1$ 

 $oldsymbol{\kappa} oldsymbol{b}_{2i+1}$ 

 $oldsymbol{\kappa} oldsymbol{b}_{2i-1}$ 

$$\kappa b_{2i}^+$$

$$\kappa b_{2i}^-$$

 $oldsymbol{\kappa} oldsymbol{b}_{i+1}$ 

 $oldsymbol{\kappa} oldsymbol{b}_{i-1}$ 

 $oldsymbol{\kappa} oldsymbol{b}_i$ 

$$oldsymbol{\kappa}oldsymbol{b}_{n-1}$$

 $oldsymbol{\kappa} oldsymbol{b}_{n-2}$ 

$$oldsymbol{M}_1(s+ds)$$

$$-oldsymbol{M}_1(s)$$

$$oldsymbol{M}_2(s+ds)$$

$$-oldsymbol{M}_2(s)$$

$$oldsymbol{M}(s+ds)$$

$$-oldsymbol{M}(s)$$





$$-oldsymbol{N}(s)$$



$$-oldsymbol{Q}(s)$$



## $s_0$



 $s_{i+1}$ 

 $s_{i-1}$ 







## $S_{+}$

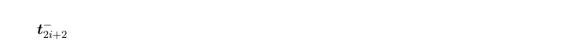
$$m{T}_1(s+ds)$$

$$-oldsymbol{T}_1(s)$$

$$T_2(s+ds)$$

$$-oldsymbol{T}_2(s)$$















 $oldsymbol{u}_{2i+1}$ 





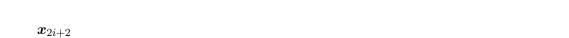
 $\boldsymbol{u}_{2i}$ 















 $\boldsymbol{x}_{2i}$ 

 $oldsymbol{x}_{i+1}$ 

$$oldsymbol{x}_{i-1}$$









$$\tilde{x}_i^+$$

$$ilde{oldsymbol{x}}_i^-$$



