

# Implementation of Modified Gram-Schmidt

- In modified G-S,  $P_{\perp q_i}$  can be applied to all  $v_j$  as soon as  $q_i$  is known
- Makes the inner loop iterations independent (like in classical G-S)

## Classical Gram-Schmidt

```
for  $j = 1$  to  $n$   
     $v_j = a_j$   
    for  $i = 1$  to  $j - 1$   
         $r_{ij} = q_i^* a_j$   
         $v_j = v_j - r_{ij} q_i$   
     $r_{jj} = \|v_j\|_2$   
     $q_j = v_j / r_{jj}$ 
```

## Modified Gram-Schmidt

```
for  $i = 1$  to  $n$   
     $v_i = a_i$   
    for  $j = i + 1$  to  $n$   
         $r_{ij} = q_i^* v_j$   
         $v_j = v_j - r_{ij} q_i$   
     $r_{ii} = \|v_i\|$   
     $q_i = v_i / r_{ii}$ 
```