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SUBROUTINE GET_HALO_START_D(PSRC,...)
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...  
IF (.NOT.GSOUTH) THEN  
    !$acc host_data use_device(PZSOUTH_OUT)  
    CALL MPI_Irecv(PZSOUTH_OUT, SIZE(PZSOUTH_OUT), MNHREAL_MPI, NP_SOUTH-1, &  
        1000+IS_NORTH, NMNH_COMM_WORLD, KREQ(NB_REQ), IERR)  
    !$acc end host_data  
ENDIF  
...  
IF (.NOT.GNORTH) THEN  
    !$acc kernels async(IS_NORTH)  
    PZNORTH_IN(KIIB:KIIE, KIJE-KIHALO_1:KIJE,:) = PSRC(KIIB:KIIE, KIJE-KIHALO_1:KIJE,:)  
    !$acc end kernels  
ENDIF  
...  
!$acc wait  
...  
IF (.NOT.GNORTH) THEN  
    !$acc host_data use_device(PZNORTH_IN)  
    CALL MPI_Isend(PZNORTH_IN, SIZE(PZNORTH_IN), MNHREAL_MPI, NP_NORTH-1, &  
        1000+IS_NORTH, NMNH_COMM_WORLD, KREQ(NB_REQ), IERR)  
    !$acc end host_data  
ENDIF  
END SUBROUTINE GET_HALO_START_D
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SUBROUTINE GET_HALO_STOP_D(PSRC,...)
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...  
CALL MPI_Waitall(NB_REQ, KREQ, MPI_STATUSES_IGNORE, IERR)  
...  
IF (.NOT.GSOUTH) THEN  
    !$acc kernels async(IS_SOUTH)  
    PSRC(KIIB:KIIE, 1:KIJB-1,:) = PZSOUTH_OUT(KIIB:KIIE, 1:KIJB-1,:)  
    !$acc end kernels  
ENDIF  
...  
!$acc wait  
END SUBROUTINE GET_HALO_STOP_D
```