```
classdef createTWPA
    properties
        fsim {mustBeNumeric}
        ksim {mustBeNumeric}
        gsim {mustBeNumeric}
        pumpF {mustBeNumeric}
        pumpF2 {mustBeNumeric}
        Ip {mustBeNumeric}
        I0 {mustBeNumeric}
        Idc {mustBeNumeric}
        Istar {mustBeNumeric}
        len {mustBeNumeric}
        modes {mustBeNumeric}
        betanl {mustBeNumeric}
    end

    methods
        function getK = k(self, freq)
            getK = interp1(self.fsim,self.ksim,freq);
        end

        function getG = g(self, freq)
            getG = interp1(self.fsim,self.gsim,freq);
        end

        function self = addMode(self,mode,varargin)

            if length(varargin) == 1
                order = varargin{1};
            elseif self.Idc == 0
                order = 4;
            else
                order = 5;
            end

            % Look for instances of pumps
            if isempty(regexpi(mode,'p', 'once'))
                p = 0;
            else
                if isempty(regexpi(mode,'\dp', 'once'))
                    if  isempty(regexpi(mode,'-p', 'once'))
                        p = 1;
                    else
                        p = -1;
                    end
                else
                    if  isempty(regexpi(mode,'-\dp', 'once'))
                        p = str2num(mode(regexpi(mode,'\dp', 'once')));
                    else
                        p = -str2num(mode(regexpi(mode,'\dp', 'once')));
                    end
                end
```

```
end


% Look for instances of signals
if isempty(regexpi(mode,'s', 'once'))
    s = 0;
else
    if isempty(regexpi(mode,'\ds', 'once'))
        if  isempty(regexpi(mode,'-s', 'once'))
            s = 1;
        else
            s = -1;
        end
    else
        if  isempty(regexpi(mode,'-\ds', 'once'))
            s = str2num(mode(regexpi(mode,'\ds', 'once')));
        else
            s = -str2num(mode(regexpi(mode,'\ds', 'once')));
        end
    end
end

% Look for instances of idlers
if isempty(regexpi(mode,'i', 'once'))
    i = 0;
else
    if isempty(regexpi(mode,'\di', 'once'))
        if  isempty(regexpi(mode,'-i', 'once'))
            i = 1;
        else
            i = -1;
        end
    else
        if  isempty(regexpi(mode,'-\di', 'once'))
            i = str2num(mode(regexpi(mode,'\di', 'once')));
        else
            i = -str2num(mode(regexpi(mode,'\di', 'once')));
        end
    end
end


% add only 3WM idlers
if order == 3
    self.modes = cat(1,self.modes,[p+i s-i]);
% add only 4WM idlers
elseif order == 4
    self.modes = cat(1,self.modes,[p+2*i s-i]);
% add both idlers
elseif i ~= 0
        self.modes = cat(1,self.modes,[p+i s-i]);
        self.modes = cat(1,self.modes,[p+2*i s-i]);
else
    self.modes = cat(1,self.modes,[p s]);
```

```
            end

        end
    end
end
```

```
ans =

  createTWPA with properties:

      fsim: []
      ksim: []
      gsim: []
     pumpF: []
    pumpF2: []
        Ip: []
        I0: []
       Idc: []
     Istar: []
       len: []
     modes: []
    betanl: []
```

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